Military Readiness Activities at Fallon Range Training Complex, Nevada

Final Environmental Impact Statement Volume Two

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Appendix E: Noise Study

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NOISE STUDY FOR THE FALLON RANGE TRAINING COMPLEX

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Acronyms & Abbreviations

ID	Definition
AAD	Annual Average Daily
AG	Air-to-Ground
AGL	Above Ground Level
AICUZ	Air Installation(s) Compatible Use Zone(s)
ANSI	American National Standards Institute
ARR	Aerial Refueling Route
ARTCC	Air Route Traffic Control Center
ATCAA	Air Traffic Control Assigned Airspace
BFM	Basic Fighter Maneuvers
BLM	Bureau of Land Management
BNOISE	Blast Noise Prediction
BRAC	Base Realignment and Closure
CAS	Close Air Support
CHPPM	Center for Health Promotion and Preventive Medicine
CMC	Commandant of the Marine Corps
CNO	Chief of Naval Operations
CSAR	Combat Search and Rescue
CSFWP	Commander, Strike Fighter Wing Pacific
CSFWPD	Commander, Strike Fighter Wing Pacific Detachment
CVW	Carrier Air Wing
CY	Calendar Year
dB	Decibel
DEM	Digital Elevation Map
DNL	Day-Night Average Sound Level
DoD	Department of Defense
DoN	Department of the Navy
DZ	Drop Zone
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FAC	Forward Air Controller
FICON	Federal Interagency Committee on Noise
FICUN	Federal Interagency Committee on Urban Noise
FRS	Fleet Replacement Squadron
FRTC	Fallon Range Training Complex
ft	Feet
FY	Fiscal Year
HE	High Explosive
ID	Identification
IFR	Instrument Flight Rules
JDAM	Joint Direct Attack Munitions
L_{Cdn}	C-Weighted Day-Night Average Sound Level
L_{dnmr}	Onset-Rate Adjusted Monthly Day-Night Average Sound Level

ID	Definition
$L_{eq(h)}$	Hourly Average Sound Level
LGE	Large Force Exercises
LGTR	Laser Guided Training Round
L_{max}	Maximum Sound Level
LTA	Laser Target Area
LZ	Landing Zone
MAS	Maritime Air Support
MOA	Military Operating Area
MR_NMAP	MOA Range Noise Model
MSL	Mean Sea Level
MTR	Military Training Route
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
NDA	No Drop Area
NMAP	NOISEMAP
NSAWC	Naval Strike and Warfare Center
NSW	Naval Special Warfare
PMCF	Post Maintenance Check Flights
POI	Point of Interest
POL	West Petrolium, Oil, and Lubricant Facility
RAICUZ	Range Air Installations Compatible Use Zones
RASS	Range Air Surveillance System
RDT&E	Research, Development, Test and Evaluation
RH	Relative Humidity
SAM	Surface-to-Air
SEL	Sound Exposure Level
SEL_r	Onset-rate Adjusted Sound Exposure Level
SFTI	Strike Fighter Tactics Instructor
SFWD	Strike Fighter Wing Detachment
SOA	Supersonic Operating Area
STRIKE U	Naval Strike Warfare Center
SUA	Special Use Airspace
SUW	Anti-Surface Warfare
T&G	Touch-and-Go
TACTS	Tactical Aircrew Training System
TNT	Trinitrotoluene
TOPDOME	Carrier Airborne Early Warning Weapons School
TOPGUN	Navy Fighter Weapons School
UCAV	Unmanned Combat Air Vehicle
US	United States
USMC	United States Marine Corps
VFR	Visual Flight Rules
WISS	Weapons Impact Scoring System
WMD	Weapons of Mass Destruction

Executive Summary

This report presents the noise analysis for the Fallon Range Training Complex (FRTC) near Fallon, Nevada. The Southwest Division of NAVFAC has contracted Ecology and Environment Inc. to analyze the current noise environment at FRTC. The results of this noise analysis may be incorporated into the RAICUZ program at a future time.

This report examines aircraft and air-to-ground large caliber weapons noise for an Existing condition described as Fiscal Year (FY) 2010 activities and a Prospective condition described as FY2015 activities. During FY2010, 42,606 annual sorties and 5,409 busiest month sorties for the month of August in FY2010 were conducted within the airspace designated as Restricted Area R-4803 and associated target area Bravo 16, Restricted Area R-4804 and associated target area Bravo 17, R-4810 and associated target area Bravo 19, and finally, R-4813 and associated target area Bravo 20. The primary users were the F/A-18C/D legacy Hornet, the F/A-18E/F Super Hornet, the F-16 Fighting Falcon, the F-5 Tiger, and the H-60 Seahawk aircraft, which totaled 40,325 annual and 5,119 busiest month. The Navy is currently in the process of transitioning from F/A-18C/D to F/A-18E/F aircraft and anticipates that the F/A-18C/D will comprise approximately 45 percent while the F/A-18E/F the remaining 55 percent of Hornets for the Prospective FY2015 condition. The Navy also anticipates an increase in overall operation at FRTC of 10 percent.

The FRTC is the focal point for all Navy, and some Marine, graduate level aviation strike warfare training under the cognizance of NSAWC. The Navy determined that a typical busy month would include both TOPGUN and Carrier Air Wing (CVW) training for an estimated 540 and 724 adversary type sorties, respectively. The TOPGUN and CVW training often utilizes large portions of FRTC which extend beyond individual MOAs. These 1,264 busy month adversary sorties are included in the FY2010 analysis. Although FY2015 busy month adversary sorties are not expected to change the Navy wide transition from F/A-18C/D to F/A-18E/F is assumed to apply to the adversary sorties.

Most supersonic flights occur during adversarial training simulating air-to-air combat situations. Typical adversarial exercises are the TOPGUN and CVW Large Force Exercise (LFE). It is common for most aircraft capable of supersonic flight to spend a portion of adversarial sorties at speeds greater than Mach 1 while operating in the Supersonic Operating Area (SOA). The FY2010 busy month supersonic sorties were determined to be 458 events based upon sortie counts from Gabbs North and Austin 1, which are located primarily within the SOA. The FY2015 supersonic sorties would be affected by the Navy Hornet transition and 10 percent increase in operations resulting in 503 busy month sorties.

The live air-to-ground large caliber weapons noise is defined as round greater than 20 mm. During FY2010, a combined 2,757 MK-82, MK-83, MK-84 bombs and AGM-114 Hellfire missiles were delivered into Bravo 17, Bravo 19 and Bravo 20 live target areas. The FY2015 events were estimated using a 10 percent increase in operations resulting in 3,034 total bomb and missile events. This report compared the reported FY2010 and estimated FY2015 events with the previous study's (WR 06-07) FY2003 modeled 3,354 bombs and missiles. Since the WR 06-07 FY2003 modeling included more events it will serve as a slightly conservative representation for both scenarios of this study.

For the Prospective FY2015 conditions, the 10 percent increase in aircraft operations and the new ratio of Hornet aircraft, resulted only in slight increases in the L_{dnmr} noise levels. The resulting contours for FRTC are virtually unchanged with an overall increase in L_{dnmr} of approximately 1 dB or less. The noise exposure along the Stillwater and Shoshone corridors would increase L_{dnmr} up to 1 dB and the width of the 65 and 60 contours would increase by about 10 percent. Bravo 16, 17, 19, and 20 areas would experience noise exposure increases less than 1 dB L_{dnmr}. The increase in supersonic events in the SOA would cause less than 1 dB increase in L_{Cdn} due to the small increase in supersonic events.

The Prospective C-weighted DNL contours for large caliber weapons events were not modeled in this analysis. However, both the Baseline FY2010 and Prospective FY2015 C-weighted DNL contours would be the same or slightly smaller than those for FY2003 because they include slightly lower numbers of bomb and missile expenditures.

FY2003 large caliber weapons noise contours are the result of the detonation of live ordnance within the target areas and the noise resulting from the blast component of such events. The 62 dBC contours associated with Bravo 17, Bravo 19 and Bravo 20 remain within 3.5 miles of the live target area. The 70 dBC contours associated with the same ranges remain within one mile of the live target area. The contours are the result of the detonation of MK bombs and Hellfire missiles. No change in the large caliber weapons noise contours for FY2015 was found since they are also defined as the WR 06-07 FY2003 contours.

SECTION

1 Introduction

The Naval Facilities Engineering Command (NAVFAC) conducts aircraft noise surveys at various Naval and Marine Corps facilities throughout the United States and overseas. The noise exposure contours developed during these studies are incorporated into Air Installations Compatible Use Zones (AICUZ), Range Air Installation Compatible Use Zones (RAICUZ) or other environmental documents. AICUZ and RAICUZ documents are used to promote the compatibility of Navy and Marine Corps activities with neighboring land uses.

In 2006, Wyle had completed a noise study report for the Fallon Range Training Complex (FRTC); the Range) based on Fiscal Year (FY) 2003 activity as a baseline condition and projected future activity for a FY2011 scenario including aircraft and large caliber weapons noise (Arnefia, et al, 2006). The purpose of this report is to update and expand WR 06-07 for the purposes of the ongoing Encroachment Action Plan (EAP) for the Naval Air Station (NAS) Fallon-administered areas which comprise the FRTC. These include:

- R-4403 and associated target area Bravo 16 (B-16),
- R-4804 and associated target area Bravo 17 (B-17),
- R-4810 and associated target area Bravo 19 (B-19), and
- R-4813 and associated target area Bravo 20 (B-20).

In addition to the above target area ranges the FRTC includes 10 Military Operating Areas (MOAs), 4 Air Traffic Control Assigned Airspaces (ATCAAs), and a Supersonic Operating Area (SOA).

This study includes a Baseline condition, defined by the Fiscal Year (FY) 2010 tempo of activities and a Prospective condition defined by FY2015 projected activities. The FY2015 analysis accounts for the continuing transition of F/A-18C/D Hornet to F/A-18E/F Super Hornet and EA-6B Prowler to EA-18G Growler and an overall increase in operations of 10 percent relative to Baseline conditions.

This report is organized into five main sections and one appendix. Section 1.0, this section, is the introduction to the study. Section 2.0 discusses the study background, including an overview of the methodology guiding noise modeling, and introduces noise metrics and the computerized noise models used to compute the noise levels. Section 3.0 provides a description of FRTC training ranges and airspace. Sections 4, 5 and 6 present the noise exposure due to subsonic, supersonic and large caliber weapons events, reapectively. Appendix A details the modeling parameters and inputs for this study.

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SECTION 2

Study Methodology and Data Collection

This section describes the data collection procedures and an overview of the noise analysis methodology (Section 2.1), noise metrics and computerized noise models (Section 2.2) and geospatial analysis (Section 2.3).

2.1 Data Collection

In December of 2010, the data collection phase began with a site visit to FRTC to meet with the appropriate personnel to gather data. Data gathered included range information, typical flight tracks and areas, flight profiles and types and quantities of ordnance used. Points of contact are shown in Table 2-1.

Table 2-1 Points of Contact

Name	Title/Function	Organization	Phone	E-Mail
Danny O'Hara	F-18/16 A/6 Employment	Topgun	775-426-4056	daniel.k.ohara@navy.mil
James P. Williams	Air Traffic Cont.	Air/Ops	775-426-2464	james.p.williams@navy.mil
Dan Cheevor	NSAWC Spcl. Assist	NSAWC	775-426-2656	daniel.cheevor@navy.mil
Rob Whitmore	E-26 Radar/ Radar EP	NSAWC (CAEWWS)	775-426-3245	robert.whitmore@navy.mil
Bradley Monger	EP-3E WTI	NSAWC (ER)	775-426-2272	bradley.monger@navy.mil
Scott Craig	NSAWC Joint Program.	NSAWC	775-426-3951	scott.p.craig@navy.mil
Peter Fey	Sead/EW Branch	NSAWC NS	775-426-3932	peter.fey@navy.mil
Kevin Korcheck	Training Lands & Ranges	NVRANG	775-667-5217	kevin.korcheck@us.army.mil
Jonathan Ashbaugh	Force Integration Readiness Officer	NVRANG	775-887-7365	jonathan.ashbaugh@us.army.mil
Rajagepal Krishnamoorthy	1 EPM NAS Fallon	PASD Fallon ENV	775-426-2244	raj.krishnamoorthy@navy.mil
Robin Bowers	Archaeologist NAS Fallon	NAS Fallon PWD	775-426-3027	robin.bowers@navy.mil
Becky Kurtz	ENV NAS Fallon	NAVFAC	775-426-2242/2382	becky.kurtz@navy.mil
Gary Cottle	NAS Fallon	NAVFAC	775-426-2956	gary.cottle@navy.mil
Scott Johnston	LtCol/Range Development	Mtn. Warfare Train. Ctr.	209-840-4001	scott.johnston@usmc.mil
John Irvin	Civ./ Range Development	Mtn. Warfare Train. Ctr.	760-932-1439	john.irvin@usmc.mil
Ricardo Bravo	Chief of Tactics	152 AW	70-890-830-4720	ricardo.bravo@ang.af.mil
Phil Sandberg	SOC	NSW TGM	757-358-5360	
Brian Cameron	SOC	NSW TGM	619-618-9959	
Stacy Haruguchi	Cont./ NSW Gnd Training Coord.	NSW TGM	757-344-6274	stacy.haruguchi.ctr@navy.mil
CDR Tony Gilbert	F-5	NSAWC	775-426-3644	anthony.gilbert@navy.mil
Joseph Czech	Project Manager for Noise Study	Wyle	310-738-5943	joseph.czech@wyle.com
Patrick Kester	Engineer for Noise Study	Wyle	310-563-6636	patrick.kester@wyle.com

Follow-up data validation packages were provided to FRTC personnel for review and validation through email (Czech 2011). This ensures the completeness and validity of the data upon which the noise modeling. The data validation process includes various interactions leading to the refinement of the modeling data and its approval for analysis, including:

- Preparation and submittal of detailed tables and summary visualizations of annual flight operations by specific aircraft type, day/night periods and type of operation, clearly labeled for each scenario, developed from input provided by Range personnel and NAVFAC. These data along with associated assumptions and methodologies form the basis of the data validation package and are targeted in content to obtain speedy and effective review by Range personnel and NAVFAC.
- Coordination of input on their integration into modeled profiles for the Range. An internal review and validation process assesses the feasibility and applicability of the profiles and identifies information gaps or feedback questions to NAVFAC.

- Assurance that acoustic source data and all topographical and weather data are accurate and that model assumptions are validated by NAVFAC prior to their exercise.

Figure 2-1 provides an overview of the major phases of the study and their associated quality control and program performance steps.

Figure 2-1 Major Phases of the Noise Study

Quality assurance is an indispensable component of the noise study process and data validation is an essential step to ensuring stakeholder acceptance of study inputs, assumptions and results. An internal assessment and validation process performed by Wyle environmental engineers and military operations experts allows not only for the review and integration of scientific, operational, and base planning knowledge into the noise modeling process.

2.2 Noise Metrics and Modeling

2.2.1 Noise Metrics

The Federal Interagency Committee on Aviation Noise[1] (FICAN) uses three types of metrics to describe noise exposure:

1) A measure of the highest sound level occurring during an individual aircraft overflight
2) A combination of the maximum level of that single event with its duration; and
3) A description of the cumulative noise environment based on all noise events over a period of time.

The DoD and other FICAN members use Maximum Sound Level (L_{max}), Sound Exposure Level (SEL) and Day-Night Average Sound Level (L_{dn}) for the aforementioned three types, respectively.

The metrics used to describe aircraft noise in this study are presented in terms of A-weighted decibels (dBA), which de-emphasizes low-frequency noise, i.e., noise containing components less than 200 Hertz (Hz), to approximate the response and sensitivity of the human ear. Ordnance noise, which is impulsive, contains more low-frequency noise energy, and is best described in terms of C-weighted decibels (dBC), with little low-frequency de-emphasis. Because they typically contain more low-frequency energy, impulsive sounds may induce secondary effects, such as shaking of a structure, rattling of windows, and inducing vibrations. These secondary effects can cause additional annoyance and complaints.

Sections 2.2.1.1 through 2.2.1.3 of this report address the airspace noise metrics while Sections 2.2.1.4 through 2.2.1.6 describe the ordnance noise metrics.

[1] DoD is a member of FICAN.

2.2.1.1 Maximum Sound Level (L_{max}) and Sound Exposure Level (SEL)

During an aircraft overflight, the noise level starts at the ambient or background noise level, rises to the maximum level as the aircraft flies closest to the observer, and returns to the background level as the aircraft recedes into the distance. At any given time during the event, the measured sound level is actually an average taken over one-eighth of a second. The variation in sound level with time is shown by the solid line in Figure 2-2. The maximum sound level, L_{max}, is the instantaneous maximum sound level measured/heard during the event. The L_{max} is important in judging the interference caused by a noise event with conversation, TV or radio listening, sleep, or other common activities. Although it provides some measure of the intrusiveness of the event, it does not completely describe the total event, because it does not include the period of time that the sound is heard.

The Sound Exposure Level, SEL, is a composite metric that represents all of the sound energy of the event and includes both the intensity of a sound and its duration. The SEL metric is the best metric to compare noise levels from overflights of different aircraft types. For sound from military aircraft overflights near airfields, the SEL is usually 5 to 10 dBA greater than the L_{max}. For example, the L_{max} of the sample event in Figure 2 is 93.5 dBA whereas the SEL is 102.7 dBA. However, for sound from military aircraft overflights on MTRs, the SEL is usually 3 to 5 dBA greater than the L_{max}, with the difference generally lessening for decreasing altitude and increasing speed (Plotkin and Croughwell 1987; Plotkin and Bradley 1991).

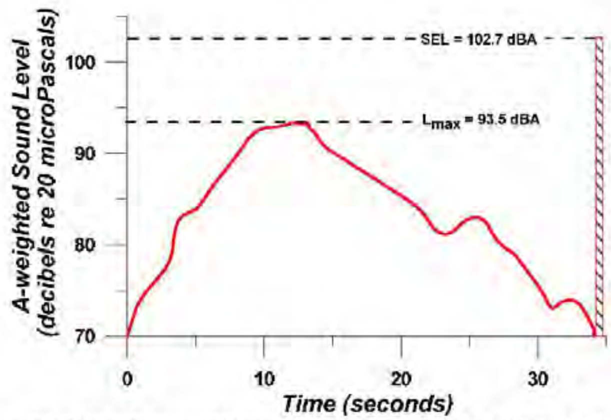

Figure 2-2 Example of Maximum Sound Level and Sound Exposure Level from an Individual Event

2.2.1.2 Day-Night Average Sound Level (DNL or L_{dn})

The Day-Night Average Sound Level, DNL, is a composite noise metric accounting for the sound energy of all noise events in a 24-hour period. In order to account for increased human sensitivity to noise at night, a 10 dB penalty is applied to nighttime events (10:00 p.m. to 7:00 a.m. time period). Noise-sensitive land uses, such as housing, schools, and medical facilities are considered as being compatible in areas where the DNL is less than 65 dB. Noise sensitive land uses are not compatible and are discouraged in areas where the DNL is between 65 and 69 dB, and strongly discouraged where the DNL is between 70 and 74 dB. At higher levels, i.e. greater than 75 dB, land use and related structures are not compatible and should be prohibited.

Because it is an energy-based quantity, DNL tends to be dominated by the noisier events. As a simple example, consider a case in which only one daytime aircraft overflight occurs over a 24-hour period, creating a sound level of 100 dB for 30 seconds. During the remaining 23 hours, 59 minutes and 30 seconds of the day, the ambient sound level is 50 dB. The resultant DNL would be 66 dB. In comparison, consider a second example that 10 such 30-second overflights occur during daytime hours instead, with the same ambient sound level of 50 dB during the remaining 23 hours and 55 minutes. The resultant DNL would be 76 dB. The energy averaging of noise over a 24-hour period does not ignore the louder single events and tends to emphasize both the sound levels and the number of those events.

Figure 2-3 graphically describes DNL using hourly average noise levels ($L_{eq(h)}$)for each hour of the day as an example. Note the $L_{eq(h)}$ for the hours between 10 pm and 7 am have a 10 dB penalty assigned. The DNL for the example noise distribution shown in Figure 2-3 is 65 dB.

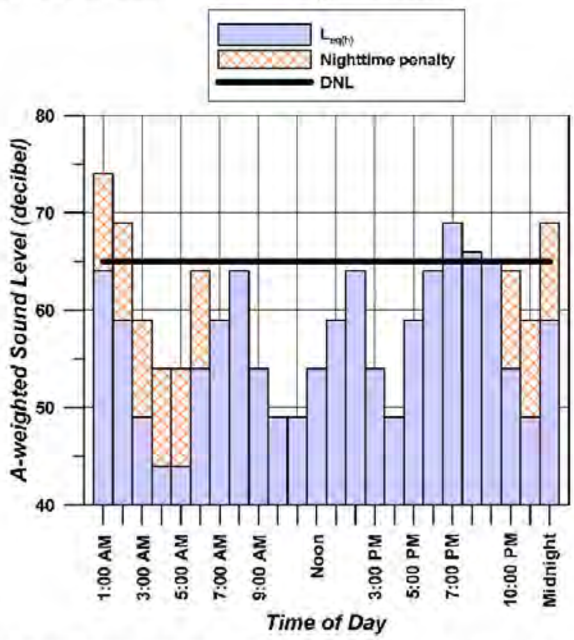

Figure 2-3 Example of Day-Night Average Sound Level Computed from Hourly Equivalent Sound Levels

2.2.1.3 Onset-Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr})

Military aircraft utilizing Special Use Airspace (SUA) such as Military Training Routes (MTRs), MOAs and Restricted Areas/Ranges, generate a noise environment that is somewhat different from that associated with airfield operations. As opposed to patterned or continuous noise environments associated with airfields, flight activity in SUAs is highly sporadic and often seasonal ranging from ten per hour to less than one per week. Individual military overflight events also differ from typical community noise events in that noise from a low-altitude, high-airspeed flyover can have a rather sudden onset, exhibiting a rate of increase in sound level (onset rate) of up to 150 dB per second.

To represent these differences, the conventional SEL metric is adjusted to account for the "surprise" effect of the sudden onset of aircraft noise events on humans with an adjustment ranging up to 11 dB above the normal SEL (Stusnick, et al, 1992). Onset rates between 15 to 150 dB per second require an adjustment of

0 to 11 dB, while onset rates below 15 dB per second require no adjustment. The adjusted SEL is designated as the onset-rate adjusted sound exposure level (SEL_r).

Because of the sporadic characteristic of SUA activity, noise assessments are normally conducted for the month with the most operations or sorties – the so-called busiest month. The cumulative exposure to noise in these areas is computed by the DNL over the busy month, but using SEL_r instead of SEL. This monthly average is denoted L_{dnmr}.

2.2.1.4 C-weighted Day-Night Average Sound Level (L_{Cdn})

Noise produced by artillery fire and detonation of air-to-ground or ground-to-ground live ammunition, such as shell bursts, surface blasting, cratering charges and aircraft bombs and rockets, are analyzed differently than other noise sources, e.g., those produced by aircraft engines because of the significantly higher energy created at low frequencies by these blasts. The report by the Committee on Hearing, Bioacoustics, and Biomechanics (CHABA) Working Group 84 recommends using the C-weighted Day-Night Average Sound Level (CDNL or L_{Cdn}) cumulative metric to define high-energy impulsive sounds (CHABA 1977).

2.2.1.5 Peak Sound Level (L_{pk})

The Peak Sound Pressure Level is the highest instantaneous level obtained by a sound level measurement device. The L_{pk} is typically measured using a 20 microseconds or faster sampling rate, and is commonly based on un-weighted or linear response of the meter. It is expressed in "dB", not "dBA" or "dBC".

2.2.1.6 Single Event Peak Level Exceeded by 15 Percent of Events [PK 15(met)]

The Single Event Peak Level Exceeded by 15 Percent of Events [PK 15(met)] is a metric used in addition to cumulative noise metrics to provide more information on the effects of noise from ordnance activity. PK 15(met) is the calculated peak noise level, without frequency (i.e. "A" or "C") weighting, expected to be exceeded by 15 percent of all modeled events. It allows assessment of the risk of noise complaints from large caliber impulsive noise resulting from armor, artillery, mortars and demolition activities. The metric PK 15(met) is similar to L_{pk} but accounts for statistical variation in single event peak noise level that is due to variable meteorological conditions. PK 15(met) is expressed in "dB", not "dBA" or "dBC".

According to the Army Regulation 200-1 (U.S. Department of the Army 2007), PK 15(met) less than 115 dB corresponds to areas of low risk of noise complaints from large caliber weapons. Noise sensitive land uses are discouraged in areas where PK 15(met) is between 115 and 130 dB with medium risk of complaints. Noise sensitive land uses are strongly discouraged in areas where PK 15(met) is equal to or greater than 130 dB with high risk of noise complaints. With large caliber weapons PK 15(met) exceeding 140 dB, there is a risk of physiological damage to unprotected human ears and structural damage claims.

2.2.2 Noise Zones

The community response to noise (in this case due to aircraft and blast) has long been a concern in the vicinity of ranges on which ordnance containing a high explosive (HE) material is expended. Noise also plays a role in land-use planning on and in the vicinity of ranges. For land-use planning purposes, the RAICUZ program generally divides noise exposure into three categories as follows:

- Noise Zone I: Defined as an area of minimal impact refers to DNL values less than 65 dBA or L_{Cdn} values less than 62 dBC. This is also an area where social surveys show less than 15 percent of the population would be expected to be highly annoyed.

- Noise Zone II: Defined as an area of moderate impact, refers to DNL values between 65 dBA and 75 dBA or L_{Cdn} values between 62 dBC and 70 dBC. This is the area where social surveys show between 15 percent and 39 percent of the population would be expected to be highly annoyed.
- Noise Zone III: Defined as an area of most severe impact, refers to DNL values greater than 75 dBA or L_{Cdn} values greater than 70 dBC. This is the area where social surveys show greater than 39 percent of the population would be expected to be highly annoyed.

2.2.3 Noise Models

This study utilized the following DoD computer-based programs for analysis of aircraft and ordnance noise exposure and compatible land uses NOISEMAP (Version 7.2), Military Operating Area and Range Noise Model (MR_NMAP; Version 2.2) and Blast Noise Prediction (BNOISE; Version 2). This section briefly describes these analysis tools used to calculate the noise levels in this report.

The programs described below are most accurate and useful for comparing "before-and-after" noise levels that would result from alternative scenarios when calculations are made in a consistent manner. The programs allow noise exposure prediction of such proposed actions without actual implementation and/or noise monitoring of those actions.

2.2.3.1 NOISEMAP

Analyses of aircraft noise exposure and compatible land uses around DoD airfield-like facilities are normally accomplished using a suite of computer-based programs, collectively called NOISEMAP (Wyle 1998; Wasmer Consulting 2006a; Wyle 2008; Wasmer Consulting 2006b). NOISEMAP is model for airbases and is most appropriate when the flight tracks are well defined, such as those near an airfield. NOISEMAP typically requires the entry of runway coordinates, airfield information, flight tracks, flight profiles along each flight track for each aircraft, numbers of daily flight operations, run-up coordinates, run-up profiles, and run-up operations. Flight and run-up profiles include the number of DNL daytime (0700-2200) and nighttime (2200-0700) events. The NOISEMAP process results in a "grid" file containing noise levels at different points of a user specified rectangular area. The spacing of the grid points for this study was 500 feet (ft). From the grid of points, lines of equal DNL (contours) of 60 dB through 85 dB (if applicable), in 5 dB increments, were plotted.

NOISEMAP can also compute DNL for specific points of interest, e.g., noise-sensitive receptors, and determine the primary contributors to the overall DNL at each point.

2.2.3.2 MR_NMAP

When the aircraft flight tracks are not well defined, but are distributed over a wide area, such as in MOA, Range/Restricted Areas, and MTRs with wide corridors, noise is assessed using the Military Operating Area and Range Noise Model (MR_NMAP (Lucas and Calamia 1994)). MR_NMAP is a distributed flight track model that allows for entry of airspace information, the horizontal distribution of operations, flight profiles (average power settings, altitude distributions, and speeds), and numbers of sorties. "Horizontal distribution of operations" refers to the modeling of lateral airspace utilization via three general representations: broadly distributed operations for modeling of MOA and Range events, operations distributed among parallel tracks for modeling of MTR events, and operations on specific tracks for modeling of unique MOA, Range, MTR, or target area activity. The core program MR_NMAP incorporates the number of monthly operations by time period, specified horizontal distributions, volume of the airspaces, and profiles of the aircraft to primarily calculate: (a) Onset-Rate Adjusted Monthly Day-

Night Average Sound Level (L_{dnmr}) at many points on the ground, (b) average L_{dnmr} for entire airspaces, or (c) maximum L_{dnmr} under MTRs or specific tracks.

From the grid of points, lines of equal L_{dnmr} (contours) of 60 dB through 85 dB (if applicable), in 5 dB increments, were plotted.

2.2.3.3 BNOISE

Noise from ordnance delivery (blast noise) is impulsive in nature and of short duration. Blast noise can consist of two components, the firing of the projectile from the weapon and the detonation of the projectile if it contains a high-explosive (HE) charge. When a projectile or bomb is released from an aircraft, and the projectile contains HE material, only the noise resulting from the detonation of the projectile is calculated. The same process is applied to a projectile that is ground-delivered. If the projectile is non-HE, only the noise resulting from the firing of the projectile is calculated. Blast noise is often a source of discomfort for persons, and vibrations of buildings and structures induced by blast noise may result in increased annoyance and risk of noise complaints or damage.

Blast noise contours are developed using the DoD's Blast Noise Prediction (BNOISE) program. BNOISE is a suite of computer programs, which together can produce L_{Cdn} contours for blasting activities or military operations resulting in impulsive noise. Input into BNOISE includes range outline data, temperature statistics for the area of study, information on the assessment period and selected noise metric firing points and their geographic coordinates, target points and their geographic coordinates, rectangular grid definition (southwest corner coordinates, length, width and the spacing between two consecutive grid points), and the firing/target pair, the ammunition type, the propellant trinitrotoluene- (TNT-) equivalent data, the height of the explosion, and the acoustical day and night firings for each activity. Similar to NOISEMAP, the BNOISE computer program processes the above files to generate a grid file, which is simply a collection of noise levels at equally spaced points of a rectangular area.

For land use compatibility assessments, BNOISE can compute L_{Cdn} or CDNL. From the grid of points, lines of equal L_{Cdn} (contours) of 62 dB and 70 dB were plotted.

For purposes of assessing the risk of noise complaints and the potential for physiological and structural damage, BNOISE computes PK 15(met). For noise complaint risk, the areas described in section 2.2.1.6 were plotted. For physiological or structural damage, contours of 140 dB PK 15(met) were plotted.

2.2.3.4 BOOMAP96

Supersonic flight can cause a sonic boom on the ground. Sonic boom is impulsive sound. BooMap96 is a program that computes L_{Cdn} contours in military Air Combat Maneuver (ACM) training airspaces based on published methodology (Frampton et al, 1993). L_{Cdn} contours in ACM arenas follow an elliptical pattern which depends on the size of the airspace and the sortie rate. BooMap96 utilizes sonic boom data gathered during three measurement programs conducted on the sonic boom environment in the Elgin MOA subsection of the Nellis Range Complex, White Sands Missile Range (WSMR) and Barry Goldwater Range East (R-2301E). Based upon that data, L_{Cdn} was determined as a function of the number of sorties per month and the dimensions of the elliptical flight area. The elliptical pattern is aligned with the "Available Airspace", or "Maneuver Ellipse" which is an elliptical maneuver region within the airspace. It is common for ACM arenas to have a single maneuver ellipse, with that region being the largest ellipse that can be inscribed within the airspace boundaries. Many supersonic areas have several maneuver ellipses, with operations divided among them. BooMap96 allows the user to define up to 10 maneuver ellipses in an airspace, and assign monthly operations to each. The program draws upon published definitions of existing MOAs and Restricted areas or user-defined airspace boundaries.

2.3 Geospatial Analysis

2.3.1 Topographical Data

The NOISEMAP suite of programs include atmospheric sound propagation effects over varying terrain, including hills and mountainous regions, as well as regions of varying acoustical impedance—for example, water around coastal regions. Elevation and impedance grid files were created to model the area surrounding the FRTC with a grid spacing of 500 feet based on data obtained from the US Geological Survey. All areas were modeled for an acoustically "soft" ground surface (with a flow resistivity of 200 kPa-s/m^2.)

The FRTC varies in elevation by several thousand feet. For the purposes of modeling the bombing patterns in Bravo 16 an arbitrary reference point near the bullseye was chosen for NOISEMAP analysis with an elevation of 3,934 feet above Mean Sea Level (MSL), and the magnetic declination is 16 degrees East (USGS 2011). All maps in this report depict a north arrow pointing to true north.

MR_NMAP does not have the capability to model varying terrain or ground impedance. It assumes all flight profiles' altitudes are relative to the elevation of the ground.

The BNOISE computer program includes atmospheric sound propagation effects over varying terrain, including hills and mountainous regions. No new elevation files were created for this study however, the previous study (Amefia, et al, 2006) did use elevation grid files to account for varying terrain. Elevation grid files had been created to model the area within the FRTC.

SECTION 3 Description of the Fallon Range Training Complex

This section describes the FRTC and an overview of the region (Section 3.1), the vicinity (Section 3.2), the aviation users and operations (Section 3.3), and climatic conditions (Section 3.4).

3.1 Regional Context

Figure 3-1 is a regional map showing the FRTC. FRTC encompasses over 234,124 acres of land area and includes land or airspace in several counties of Nevada. FRTC airspace overlies more than 6.5 million acres. A portion of the FRTC is situated in the southern part of a mostly flat basin with eight mountain ranges up to 8,800 feet MSL in elevation provide significant vertical development to the otherwise flat basin (NAVFAC et al., 2005).

3.2 Fallon Range Training Complex and Vicinity

Figure 3-2 shows a map of FRTC and its vicinity. The FRTC is comprised of four training ranges, Shoal Site, Dixie Valley Training Area, Range Air Surveillance System (RASS) sites, an Electronic Warfare Complex (EWC), a Tactical Aircrew Training System (TACTS) complex, and airspace including MOAs, restricted areas, and Air Traffic Control Assigned Airspace (ATCAA). Much of the land not administered by the Navy consists largely of public land managed by the Bureau of Land Management (BLM). Oakland and Salt Lake Air Route Traffic Control Center (ARTCC) control the airspace within the FRTC, which in turn delegate scheduling and coordination authority to the Naval Strike and Air Warfare Center (NSAWC) (NAVFAC et al., 2005).

This complex is set in well-defined geographic areas made up of land areas and multiple SUA used for training operations, research, development, test and evaluation of military hardware, personnel, munitions, aircraft, and electronic countermeasures. These areas include the BLM rights of way and 13,000 square miles of SUA.

The SUA is made up of 11 MOAs, nine restricted areas, 10 ATCAAs and an Aerial Refueling Route (ARR). Additionally, 17 Instrument Flight Rules (IFR), MTRs, three helicopter MTRs, and 14 low-level Visual Flight Rules (VFR) MTRs transit, terminate in, or are in proximity to the FRTC. The FRTC also includes the Bravo-16, Bravo-17, Bravo-19, Bravo-20, and the Dixie Valley and Shoals Site Training Areas.

NAS Fallon controls the land within the complex which includes the air station and several remote targets and associated range-related areas. The remaining 96 percent of the land area is largely used for farming, ranching, mining, and recreation. All carrier-based air groups train at the FRTC prior to deployment. It is critical to naval aviation training that the FRTC be protected from encroachment that could restrict air operations from the airfield to the ranges, including the ability to fly sorties with live ordnance at all times of day or night.

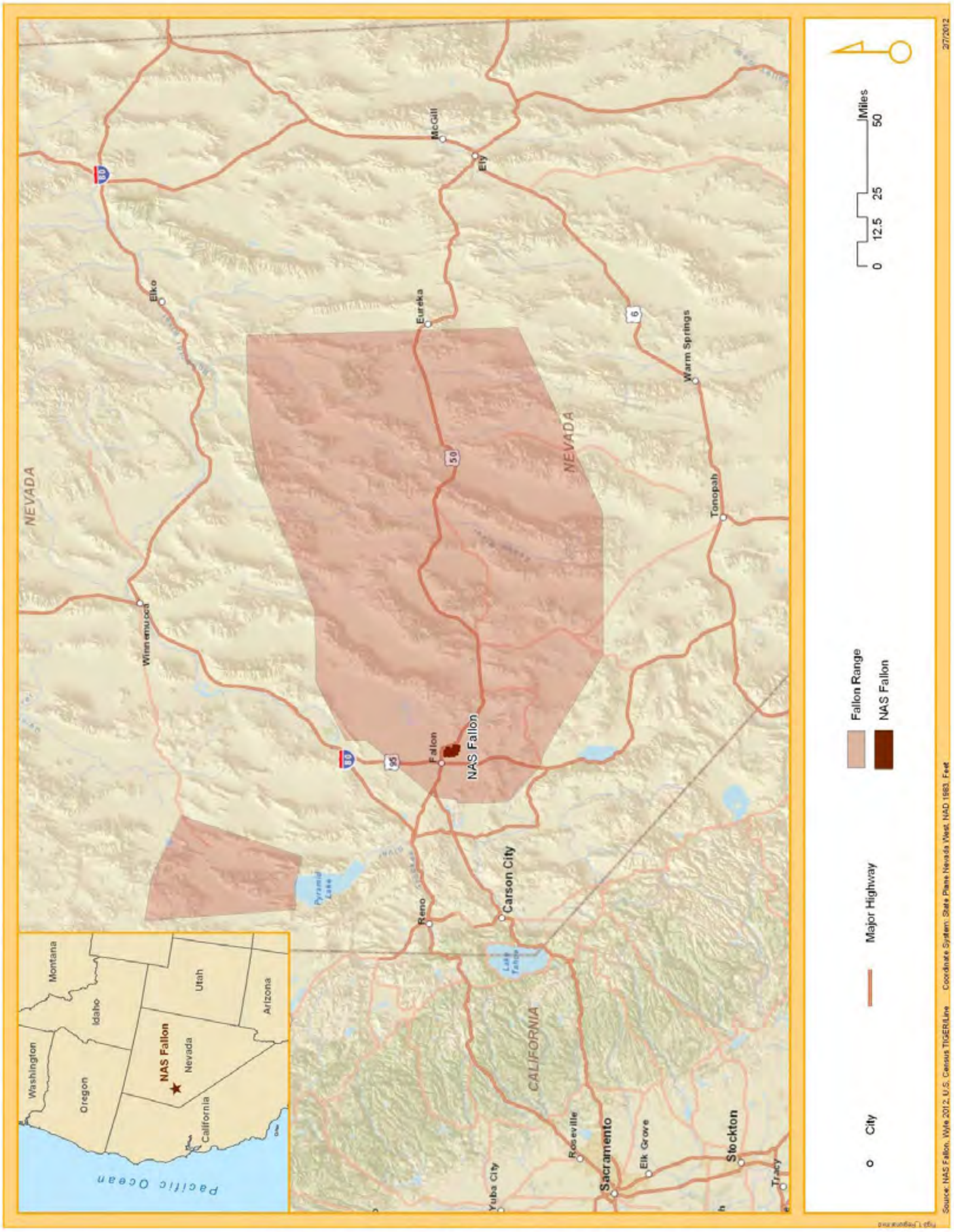

Figure 3-1 Region of Fallon Range Training Complex

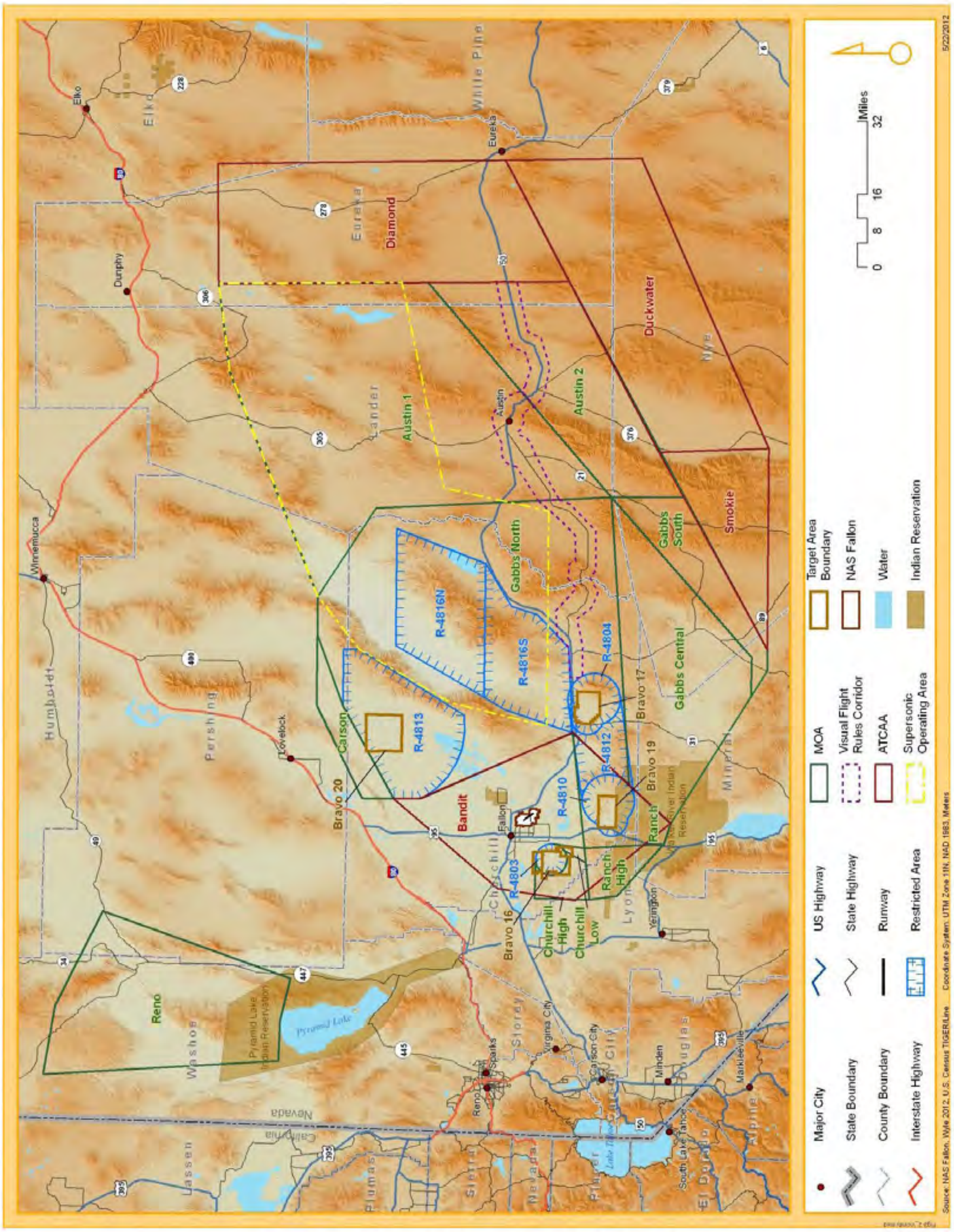

Figure 3-2 Vicinity of Fallon Range Training Complex

3.3 Fallon Range Training Complex Aviation Users and Operations

The mission of the FRTC is "to support Navy and Marine Corps tactical training by providing the most realistic strike and integrated air warfare training available, maintaining and operating facilities, and providing services and material to support the US Pacific Fleet, US Atlantic Fleet, US Marine Corps Forces Pacific, US Marine Corps Forces Atlantic, and other operating forces. RDT&E operations are also supported (DoN 2006).

While a large number of units and aircraft use the FRTC, this section focuses on the three main users from NAS Fallon: NSAWC, the Fighter Squadron Composite 13 or "Fighting Saints," and the Strike Fighter Wing Detachment.

3.3.1 Aviation Users

The Naval Strike and Air Warfare Center (NSAWC) has been based at NAS Fallon since 1984. The Base Realignment and Closure (BRAC) decision of 1993 enabled the Navy Fighter Weapons School (TOPGUN) and the Carrier Airborne Early Warning Weapons School (TOPDOME) to move to NAS Fallon from NAS Miramar. This is the center of excellence for naval aviation training and tactics development. The primary mission of NSAWC is to be the authority on training and tactics development. The Command provides services to aircrews, squadrons and air wings throughout the U.S. Navy.

NSAWC flies and maintains F/A-18 Hornet, F-16 Fighting Falcon and SH-60F Seahawk helicopters. The two main NSAWC training programs are the Carrier Air Wing (CVW) and the TOPGUN Strike Fighter Tactics Instructor (SFTI). Both of these programs utilize the FRTC for their training activities (DoN 2006).

The Fighter Squadron Composite 13 (VFC-13) or "Fighting Saints" were formed in 1973 at NAS New Orleans during a re-organization of Naval reserve forces. Initially, the squadron flew the F-8H Crusader and then the A-4L Skyhawk. The squadron transitioned to the F-5E/F Tiger II in 1993, enhancing its ability to perform its adversary mission with an even more capable and realistic threat aircraft. In 1996, the command relocated to NAS Fallon and made the transition from the F/A-18 to the F-5E/F, supported by McDonnell Douglas contract maintenance. The F-5E/F aircraft provides adversary training for regular Navy fleet and replacement squadrons, air wings, reserve fighter and attack squadrons, US Air Force (USAF) and USMC units, and Canadian forces (DoN 2006).

The Aviation Intermediate Maintenance Detachment (AIMD) supports F/A-18, F-5E and F-16 aircraft maintenance activities, for detachments of Strike Fighter Wing Detachment Fallon, VFC-13 and NSAWC. Additionally, AIMD provides maintenance support for transient carrier air wings and USMC aircraft. Services are provided to non F/A-18 systems whenever possible. AIMD has evolved into a new complex that includes a modern production control and quality assurance division with state-of-the-art airframes, Non-Destructive Inspection (NDI) and welding facility over the past several years (DoN 2006).

The Strike Fighter Wing Detachment (SFWD) has for its mission to "maintain an operationally rich aircrew training environment by providing quality organizational level maintenance for Fleet Replacement Squadron (FRS) F/A-18 aircraft and limited support for transient F/A-18 aircraft." In 1994, the detachments combined under VFA-125 to form SFWD. In late 1996, the detachment came under the control of Commander, Strike Fighter Wing Pacific (CSFWP), NAS Lemoore, CA, and was renamed Commander, Strike Fighter Wing Pacific Detachment (CSFWPD) Fallon. This allowed better coordination of training for F/A-18 fleet replacement pilots in strike and fighter weapons tactics for east and west coast Navy and Marine forces. CSFWPD's normal manning level consists of 149 enlisted personnel and three officers (DoN 2006).

The FRTC is naval aviation's premier training complex. FRTC airspace transitions for FY 2010 were 42,606 sorties and for FY 2010 to date are 129,895. Its role in the future will only grow in importance. While simulation is used in training today and will be used in the future, it cannot replace the critical training elements involved in advanced air-to-air and live fire air-to-ground training provided at the FRTC. Evolving tactics and weapons systems are moving toward use of standoff weapons and higher altitude launch. Unmanned Combat Air Vehicles (UCAVs) are being used in reconnaissance and targeting and launching weapons. More capable and in some cases noisier combat aircraft are entering the inventory and will come to FRTC. Increased encroachment pressures on other ranges will tend to expand training at FRTC in the future. As a result, the use of FRTC will only increase.

3.4 Climatic Data

Since weather is an important factor in the propagation of noise, the computer models require input of the monthly temperatures in Fahrenheit (degrees F) and percent relative humidity (percent RH). No updated weather was provided so this study utilized the condition modeled in Wyle Technical Note (TN) 11-04 (Wyle 2012), specifically 67 degrees F and 53 percent RH, which corresponds to the month of September 2002. The selection of the appropriate weather condition to be entered into the noise model is made according to procedures outlined in Air Force Procedure for Predicting Noise around Airbases: Noise Exposure Model (NoiseMap) (US Air Force 1992).

The large caliber weapons modeling with BNOISE was not updated for this study because the current operations did not change significantly from those presented in WR 06-07. The weather conditions modeled in WR 06-07 were based on calendar year (CY) 2005 with conditions of 74 degrees Fahrenheit and 15 percent relative humidity.

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SECTION 4 Noise Exposure Due to Subsonic Aircraft Operations

As an overview, Section 4.1 presents the Baseline and Proposed operations and the overall aircraft generated noise contours for all of FRTC. This overall result is the summation of (a) aircraft activity occurring in the four Bravo training ranges -- Bravo 16, Bravo 17, Bravo 19, Bravo 20, (b) ingress/egress events to/from the Bravo training ranges and (c) aircraft activity associated with Adversary Exercises, Sections 4.2 through 4.6 present a more detailed account of the operations and resultant noise exposure from ingress/egress activity, each of the four Bravo ranges and Adversary Exercises, respectively.

The term "aircraft sortie" is used to describe an aircraft taking off, conducting an activity, and then returning. Multiple operations or mission events can be conducted within one aircraft sortie. One example would be multiple bombing target passes conducted during a single sortie.

4.1 FRTC

Sections 4.1.1 and 4.1.2 present the operations and resultant noise exposure for the Baseline condition. Sections 4.1.3 and 4.1.4 contain the operations and resultant noise exposure for the Prospective scenario.

4.1.1 FRTC Baseline Aircraft Operations

A total of 42,040 annual Baseline (FY2010) sorties for each range are tabulated in Table 4-1 provided by Computer Sciences Corporation Norco (CSC Norco) (Weisenberger 2011). The F/A-18C/D and the F/A-18E/F are the primary users and perform the majority of sorties with 44 and 39 percent, respectively. The F-16 Fighting Falcon, F-5 Tiger II, and H-60 Seahawk conduct approximately seven, five, and two percent of total range sorties, respectively.

The number of aircraft events commonly varies day to day. The L_{dnmr} noise metric requires the number of operations for the busiest month. August 2010 was determined to be the busiest month for the entire FRTC of FY2010 with a total of 5,409 sorties as shown in Table 4-2. These busiest month sorties are the basis for the modeling of aircraft operations throughout this analysis. The aircraft mix for August 2010 is very similar to the FY2010 annual totals and varies by less than one percent. The F/A-18C/D, F/A-18E/F, F-16, F-5 and H-60 aircraft were modeled for this analysis (except the F-16 in B-16) and account for 95 percent of all FRTC aircraft activity. The contributions to the overall noise environment of the remaining aircraft are negligible relative to the modeled aircraft so they were not included in this analysis.

Table 4-1 Annual Sorties by Range and Aircraft Type for FY2010

Aircraft Type	B-16	B-17	B-19	B-20	Total
C-130	7	-	-	-	7
E-2	13	441	67	275	796
E/A-18G (1,2)	-	123	-	92	215
EA-6 (1)	-	304	49	240	593
FA-18A/B/C/D (1)	506	11,171	1,968	4,761	18,406
FA-18E/F (1)	613	9,508	2,132	4,132	16,385
F-16 (1)	7	1,186	299	1,305	2,797
F-5 (1)	-	897	12	1,076	1,985
H-60 (1,2)	20	376	116	240	752
MH-60	34	-	-	-	34
T-34	-	-	18	-	18
Tornado	-	29	-	23	52
Subtotal					
Modeled	1,119	23,138	4,527	11,514	40,325
Not Modeled	81	897	134	630	1,715
TOTAL	1,200	24,035	4,661	12,144	42,040

Notes:

(1) Modeled aircraft shaded

(2) H-60 and MH-60 Modeled as UH-60A

Source: CSC Norco 2011

Table 4-2 Busiest Month Sorties (August 2010)

Aircraft	B-16	B-17	B-19	B-20	Total
C-130	1	-			1
E-2	2	61	11	24	98
EA-18G		17		8	25
EA-6B		42	8	21	71
F/A-18A/C/D (1)	75	1,545	323	416	2,359
F/A-18E/F (1)	91	1,315	350	361	2,117
F-16 (1)	1	164	49	114	328
F-5 (1)		124	2	94	220
H-60 (1,2)	3	52	19	21	95
MH-60 (1)	5	-			5
T-34		-	3		3
Tornado		4		2	6
Subtotal					
Modeled	166	3,200	743	1,006	5,119
Not Modeled	23	182	34	55	290
TOTAL	189	3,382	777	1,061	5,409

Notes:

(1) Modeled aircraft shaded

(2) H-60 and MH-60 Modeled as UH-60A

Source: CSC Norco 2011

4.1.2 FRTC Baseline Aircraft Noise Exposure

Using the August 2010 busiest month sorties, NOISEMAP was used to calculate the 60 dB through 85 dB DNL contours at Bravo 16 and MR_NMAP was used to calculate the 60 dB through 85 dB L_{dnmr} contours for the other ranges, in 5 dB increments, for the Baseline scenario. The resulting L_{dnmr} contours are plotted in Figure 4-1.

The 65 dB L_{dnmr} contour exists in the vicinity of Bravo 16 due to the F/A-18 bombing passes to the conventional bullseye and approximately follows the low pop flight track. The elliptical 65 dB L_{dnmr} in Bravo 17 is primarily caused by the Conventional and Strafe patterns by the F/A-18 and F-16 which are flown between 3,000 ft AGL and 500 feet AGL. No 65 dB L_{dnmr} contour exists in the vicinity of Bravo 19 because total operations are relatively low and the operations by F/A-18 and F-16 occur above 7,000 ft AGL. The elliptical 65 dB L_{dnmr} contour is due to Air-to-Ground activities by the F/A-18 and F-16 and occur at altitudes as low as 500 ft AGL. The 65 dB L_{dnmr} contours along the fixed-wing Shoshone ingress track is primarily due to the high frequency of use by the fixed-wing aircraft. Although the usage of Stillwater is relatively low there is a 65 dB L_{dnmr} generated by the low altitude flights down to 500 ft AGL. The Baseline contours are discussed in more detail in Sections 4.2 through 4.6.

4.1.3 FRTC Prospective Aircraft Operations

This study also analyzed the anticipated FY2015 FRTC aircraft operations defined as the Prospective scenario. The Navy is currently in the process of replacing F/A-18C/D with F/A-18E/F aircraft, with a current ratio of approximately 55 and 45 percent, respectively. By FY2015 the Navy estimates that F/A-18C/D would comprise approximately 45 percent while the F/A-18E/F would comprise the remaining 55 percent of Hornets. The EA-6B and EA-18G are currently undergoing a similar replacement with the current ratio at approximately 75 and 25 percent, respectively. The Navy estimates that by FY2015 the EA-6B and the EA-18G ratio would be approximately 10 and 90 percent, respectively. The EA-6B and the EA-18G were not modeled for ingress and egress operations because they account for a very small percentage of these events. In addition to those changes in aircraft types, the Navy also anticipates an increase in overall operation at FRTC of 10 percent (Henderson 2011).

Based upon these changes the Prospective annual sorties were calculated and presented in Table4-3. A total of 46,249 annual Prospective (FY2015) sorties are anticipated for FRTC. The F/A-18C/D and the F/A-18E/F would continue to be the primary users and perform the majority of sorties with 37 and 46 percent, respectively. The F-16, F-5, and H-60 would conduct approximately seven, five, and two percent of total range sorties, respectively. These five aircraft were modeled for the Prospective analysis and account for 95 percent of all FRTC aircraft activity.

The same aircraft replacement and growth in operation changes were applied to the busiest month sorties resulting in a total of 5,857 sorties as shown in Table 4-4. These busiest month sorties serve the basis for the Prospective modeling of aircraft operations.

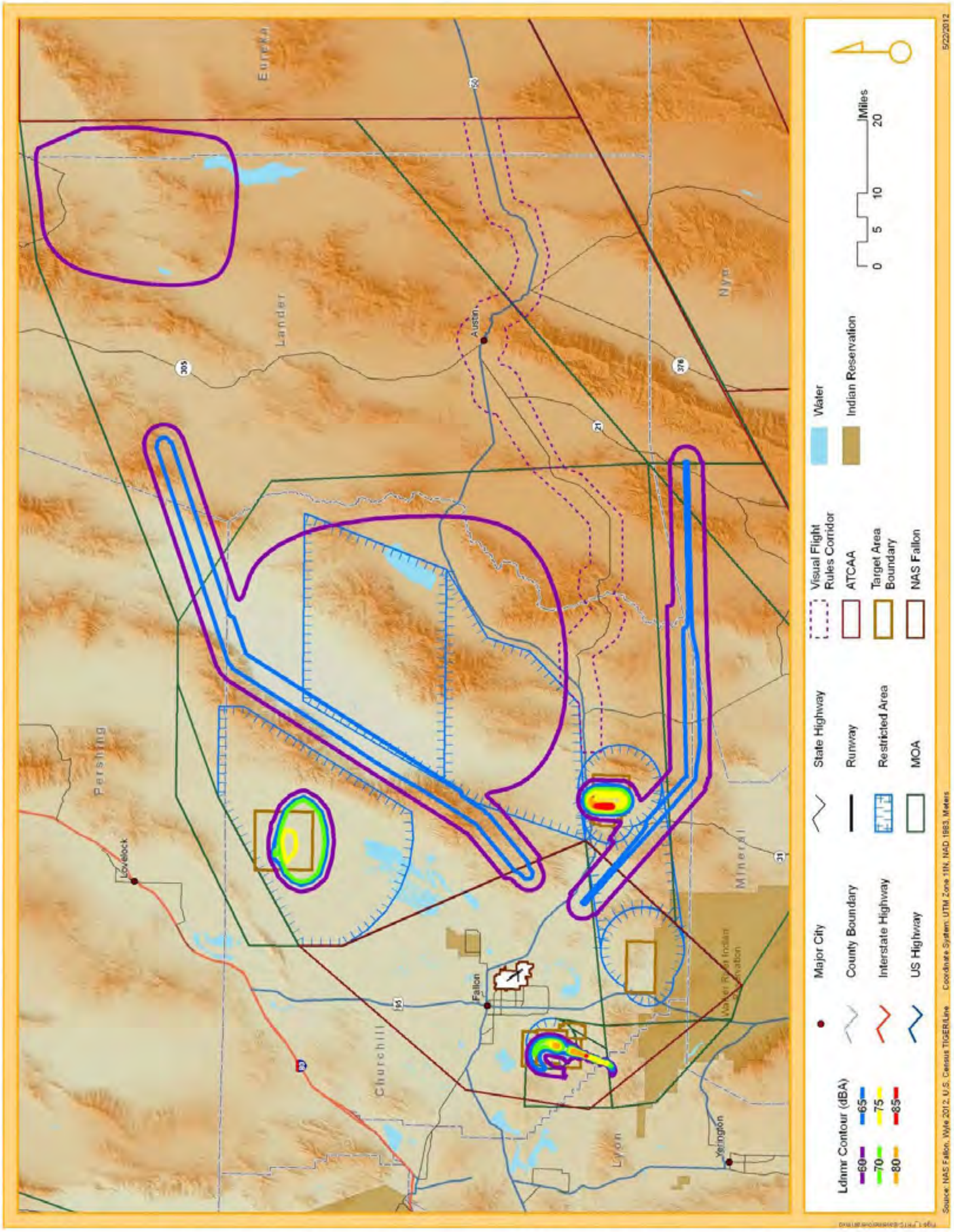

Figure 4-1 L_{dnmr} Contours for Baseline (FY2010) Aircraft Operations at FRTC

Table 4-3 Annual Sorties by Range and Aircraft Type for Prospective 2015

Aircraft Type	B-16	B-17	B-19	B-20	Total
C-130	8	-	-	-	8
E-2	14	485	74	303	876
E/A-18G	-	423	49	329	801
EA-6	-	47	5	37	89
FA-18A/B/C/D (1)	554	10,236	2,030	4,402	17,222
FA-18E/F (1)	677	12,511	2,481	5,380	21,049
F-16 (1)	8	1,305	329	1,436	3,078
F-5 (1)	-	987	13	1,184	2,184
H-60 (1,2)	22	414	128	264	828
MH-60	37	-	-	-	37
T-34	-	-	20	-	20
Tornado	-	32	-	25	57
Subtotal					
Modeled	1,231	25,453	4,981	12,666	44,361
Not Modeled	89	987	148	694	1,888
TOTAL	1,320	26,440	5,129	13,360	46,249

Notes:
(1) Modeled Aircraft shaded
(2) H-60 and MH-60 Modeled as UH-60A

Table 4-4 Busiest Month Sorties for Prospective 2015

Aircraft	B-16	B-17	B-19	B-20	Total
C-130	1	-	-	-	1
E-2	2	67	12	26	107
EA-18G		58	8	29	95
EA-6B		6	1	3	10
F/A-18A/C/D (1)	82	1,416	333	385	2,216
F/A-18E/F (1)	101	1,730	407	470	2,708
F-16 (1)	1	180	54	125	360
F-5 (1)	-	136	2	103	241
H-60 (1,2)	3	57	21	23	104
MH-60 (1)	6	-	-	-	6
T-34	-	-	3	-	3
Tornado	-	4	-	2	6
Subtotal					
Modeled	183	3,519	817	1,106	5,629
Not Modeled	13	135	24	60	228
Grand Total	196	3,654	841	1,166	5,857

Notes:
(1) Modeled Aircraft shaded
(2) H-60 and MH-60 Modeled as UH-60A

4.1.4 FRTC Prospective Aircraft Noise Exposure

Using the Prospective FY2015 busiest month sorties, NOISEMAP was used to calculate the 60 dB through 85 dB DNL contours at Bravo 16 and MR_NMAP was used to calculate the 60 dB through 85 dB L_{dnmr} contours for the other ranges, in 5 dB increments, for the Prospective scenario. The resulting L_{dnmr} contours are plotted in Figure 4-2.

The Prospective contours for FRTC are very similar to the Baseline with only a modest increase of approximately 0.5 dB L_{dnmr}. The primary cause for the increase is due to the overall increase of 10 percent across the FRTC and secondarily by the transition from the F/A-18C/D to the louder[2] F/A-18E/F. The Prospective contours are discussed in more detail in Sections 4.2 through 4.6.

[2] In most instances, the F/A-18E/F has single-event Sound Exposure Level (SEL) and Maximum Sound Levels greater than the F/A-18C/D.

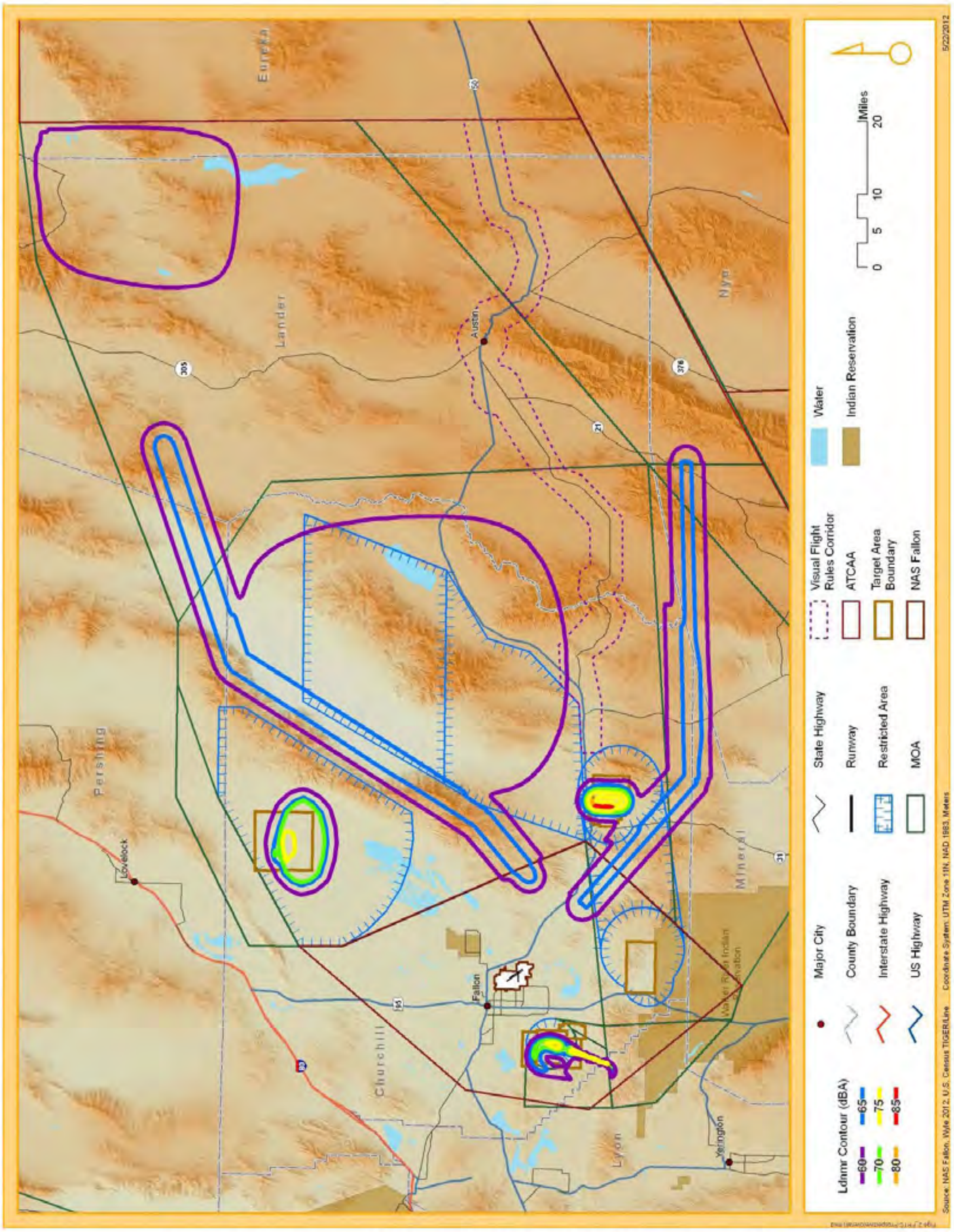

Figure 4-2 L_{dnmr} Contours for Prospective (FY2015) Aircraft Operations at FRTC

4.2 Ingress and Egress

Sections 4.2.1, 4.2.2 and 4.2.3 present the routes, profile and operations, and resultant noise exposure for the modeled Baseline condition. Sections 4.2.4 and 4.2.5 contain the modeled operations and resultant noise exposure for the Prospective scenario, respectively.

4.2.1 Modeled Routes

The modeled aircraft use a variety of routes for access to and egress from each of the four Bravo ranges. Four ingress and five egress routes were identified for fixed- and rotary-wing aircraft as the primary transit routes to and from the FRTC ranges as depicted in Figure 4-3. Aircraft typically originate at NAS Fallon for training in FRTC but may also arrive from other stations such as NAS Lemoore. The modeled routes are depicted to terminate at the Class D airspace surrounding NAS Lemoore because aircraft operations within that area have been addressed (Wyle 2012). The modeled route width on each side of the route centerline is 2.5 nautical miles for fixed-wing aircraft and 0.5 nautical miles for rotary-wing aircraft.

4.2.2 Modeled Flight Profiles and Baseline Busiest Month Operations

The specified routes commonly flown by the F/A-18 and F-16 are listed in Table 4-5a along with the route events for the busiest month. The ingress routes include, for example, Shoshone Ingress, which is an access route for both Bravo 17 and Bravo 19 flown 70 percent of the time at altitudes from 4,000 ft to 14,000 ft AGL, at Military (Mil) power setting and an average airspeed of 350 KIAS. Egress routes function in a similar manner with varying altitude ranges and slightly different average speeds.

A total of 5,024 busiest month ingress events are modeled for fixed-wing aircraft with approximately 99 percent occurring during the daytime (0700-2200) and the remaining 1 percent during nighttime (2200-0700). An equal number of egress events were modeled. The F/A-18C/D and F/A-18E/F account for the majority of FRTC operations and 44 and 39 percent of modeled ingress and egress events, respectively. The F-16 utilizes the same routes as the Hornets and comprises approximately six percent of all fixed-wing events. The F-5 aircraft utilize FRTC for different types of training so the ingress and egress usage is significantly different. The F-5 uses two ingress and three egress routes to and from Bravo 17, Bravo 19 and Bravo 20 and accounts for approximately four percent of total ingress and egress events.

H-60 helicopters typically use three routes for both ingress and egress of Bravo 17, Bravo 19 and Bravo 20 or other flight activities. The routes listed in this section are also depicted in Figure 4-3. Table 4-5b shows the profiles flown by the above aircraft on the specified routes. H-60 helicopters typically transit at speeds of 100 to 120 KIAS and altitude between 100 and 300 ft AGL. Helicopters account for 95 busiest month ingress events and an equal number of egress events, all of which occur during the L_{dnmr} daytime.

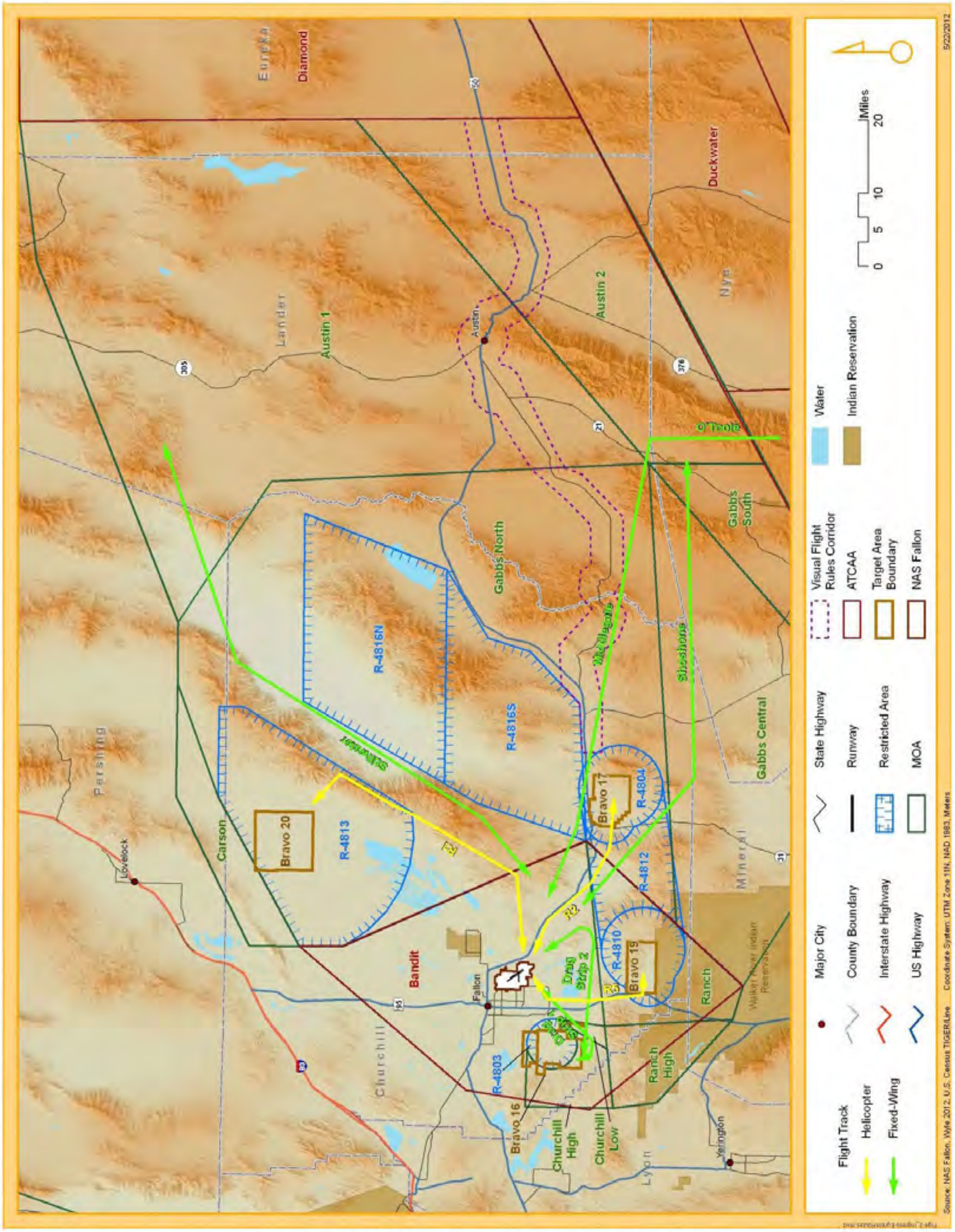

Figure 4-3 Modeled Ingress and Egress Routes for FRTC

Table 4-5a Baseline Busiest Month Fixed-Wing Ingress and Egress Events

Ingress and Egress Routes	Route Use [2]	Description	Average Power Setting (%NC or % RPM)	Avg Speed (KIAS)	Altitude (AGL)	F/A-18C/D			F/A-18E/F			F-16			F-5			Total
						Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	
Shoshone Ingress	70% (60% for F-5)	Ingress to B-17, B-19 Area	MI	350	climb to 4K by 10nm from airfield	1,583	16	1,599	1,404	14	1,418	227	2	229	131	1	132	3,378
Stillwater Ingress	30% (40% for F-5)	Ingress to B-20 Area	MI	350	climb to 4K by 10nm from airfield	678	7	685	602	6	608	97	1	98	87	1	88	1,479
Middlegate Egress	8% (1% for F-5)	Egress through Middlegate Corridor to South IAF	85	300	descend from 14k to 4k	181	2	183	161	2	163	26	-	26	2	-	2	374
Stillwater Egress	55% [4]	standard altitude (60% except for F-5)	85	300	descend from 14k to 4k	746	8	754	662	7	669	107	1	108	129	2	131	1,662
		low altitude (40% except for F-5)	85	300	0.5K-1K	497	5	502	441	5	446	71	1	72	86	1	87	1,107
Shoshone Egress	1%	Egress through Shoshone Corridor	85	300	descend from 14k to 4k	23	-	23	20	-	20	3	-	3	-	-	-	46
Other (Not Modeled)	36%	Random Direct, High Altitude (Comodore and Admiral Recoveries	85	300	descend from 14k to 4k	814	8	822	722	7	729	117	1	118	-	-	-	1,669
Drag Strip 1	50%	Ingress and Egress to B-16	85	300	5600 to 6600	74	1	75	90	1	91	1	-	1	-	-	-	167
Drag Strip 2	50%	Ingress and Egress to B-16	85	300	5600 to 6600	74	1	75	90	1	91	1	-	1	-	-	-	167
Total Ingress						2,335	24	2,359	2,096	21	2,117	325	3	328	218	2	220	5,024
Total Egress						2,335	24	2,359	2,096	22	2,118	325	3	328	217	3	220	5,025

Notes:

(1) Each sortie includes one ingress event and one egress event
(2) F-16 only uses Stillwater low altitude Egress of the Egress routes
(3) Assumed that 99 percent of events occur during DNL daytime and the remaining 1 percent during DNL nighttime
(4) 99% of F-5 egress are on Stillwater routes, 60% standard altitude and 39% low altitude

Table 4-5b Baseline Busiest Month Rotary-Wing Ingress and Egress Events

Ingress and Egress Route	Description	Track Use	Reported Average Airspeed (KIAS)	Reported Altitude (AGL)	Day (0700-2200)	Night (2200-0700)	Total
H60-R2	Ingress/Egress to/from B-17	60%	100-120	100-300	114	-	114
H60-R5	Ingress/Egress to/from B-19	20%	100-120	100-300	38	-	38
H60-R1	Ingress/Egress to/from B-20	20%	100-120	100-300	38	-	38
Total Ingress					95	-	95
Total Egress					95	-	95

Notes:

(1) Each sortie includes one ingress event and one egress event

4.2.3 Baseline Noise Exposure

Using the data mentioned in Sections 4.2.1 and 4.2.2 and further explained in Sections 4.3 through 4.6, MR_NMAP was used to calculate the 60 dB through 85 dB L_{dnmr} contours, in 5 dB increments, for the Baseline ingress/egress events. The resulting L_{dnmr} contours for all FRTC aircraft operations combined are plotted in Figure 4-1. Fixed-wing aircraft utilize Shoshone as the primary ingress route for 70 percent of all sorties. This higher frequency of events by the F/A-18 and F-16 cause L_{dnmr} up to 66 dB along the Shoshone route and up to 13,000 feet in width. Although the usage of Stillwater ingress or egress is relatively low, 40 percent of egress events utilize a low altitude of 500 to 1,000 ft AGL. These low altitude egress events by the F/A-18 are the primary cause L_{dnmr} up to 67 dB which exists along the length of the Stillwater route with a width of approximately 17,000 ft. Neither the Middlegate/O'Toole route nor the three helicopter routes L_{dnmr} exceed 65 dB. The 60 dB contour along the ingress/egress routes does not affect any densely populated areas but does reach some farmland in Pershing and Nye Counties.

4.2.4 Prospective Operations

The Prospective scenario forecasts the FRTC operations for FY2015 and ingress/ egress operations are expected to change as discussed in section 4.1.3. Based on those changes a total of 5,525 ingress and 5,525 egress events were computed for the F/A-18, F-16, and F-5 and presented in Table 4-6a. The F/A-18C/D and F/A-18E/F would continue to generate the majority of operations with 40 and 49 percent of modeled ingress and egress route events, respectively.

Prospective H-60 helicopter operations would increase by 10 percent relative to Baseline. The resulting 105 ingress and 105 egress events are listed in Table 4-6b. All events would continue to occur during the L_{dnmr} daytime.

Prospective routes and flight profiles for ingress/egress operations are not expected to change for FY2015, relative to Baseline.

4.2.5 Prospective Noise Exposure

The Prospective noise contours for the all FRTC aircraft operations combined are plotted in Figure 4-2. The 65 dB L_{dnmr} contours along the ingress and egress routes are very similar to Baseline in terms of size and shape. L_{dnmr} would increase less than 1 dB along all ingress and egress routes and the widths of the 65 dB L_{dnmr} would remain approximately the same as Baseline. The 60 dB contour along the ingress/egress routes would be virtually identical to Baseline and would not affect any densely populated areas but would reach some agricultural land use in Pershing and Nye Counties.

Table 4-6a Prospective Busiest Month Fixed-Wing Ingress and Egress Events

Ingress and Egress Routes	Description	F/A-18C/D			F/A-18E/F			F-16			F-5			Total
		Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	
Shoshone Ingress	Ingress to B-17, B-19 Area	1,479	15	1,494	1,808	18	1,826	249	2	251	144	1	145	**3,716**
Stillwater Ingress	Ingress to B-20 Area	634	6	640	774	8	782	106	1	107	96	1	97	**1,626**
Middlegate Egress	Egress through Middlegate Corridor to South IAF	169	2	171	207	2	209	28	-	28	2	-	2	**410**
Stillwater Egress	standard altitude	697	7	704	852	9	861	117	1	118	142	2	144	**1,827**
	low altitude	465	5	470	568	6	574	78	1	79	95	1	96	**1,219**
Shoshone Egress	Egress through Shoshone Corridor	21	-	21	26	-	26	4	-	4	-	-	-	**61**
Other (Not Modeled)	Random Direct, High Altitude (Comodore and Admiral Recoveries	760	8	768	929	9	938	128	1	129	-	-	-	**1,835**
Drag Strip 1	Ingress and Egress to B-16	81	1	82	99	1	100	1	-	1	-	-	-	**183**
Drag Strip 2	Ingress and Egress to B-16	81	1	82	99	1	100	1	-	1	-	-	-	**183**
Total Ingress		**2,194**	**22**	**2,216**	**2,681**	**27**	**2,708**	**356**	**3**	**359**	**240**	**2**	**242**	**6,626**
Total Egress		**2,193**	**23**	**2,216**	**2,681**	**27**	**2,708**	**356**	**3**	**369**	**239**	**3**	**242**	**6,626**

Table 4-6b Prospective Busiest Month Rotary-Wing Ingress and Egress Events

Ingress and Egress Route	Description	Track Use	Average Airspeed (KIAS)	Altitude (AGL)	Day (0700-2200)	Night (2200-0700)	Total
H60-R2	Ingress/Egress to/from B-17	60%	100-120	100-300	126	-	126
H60-R5	Ingress/Egress to/from B-19	20%	100-120	100-300	42	-	42
H60-R1	Ingress/Egress to/from B-20	20%	100-120	100-300	42	-	42
Total Ingress					105	-	105
Total Egress					105	-	105

Notes:

(1) Each sortie includes one ingress event and one egress event

4.3 Bravo 16

The B-16 range is located approximately 6 miles west of NAS Fallon and approximately 7 miles southwest of the City of Fallon. The range consists of two Weapons Impact Scoring Set (WISS) scored bullseye targets (bulls). The elevation of the bulls is approximately 3,900 ft MSL with local terrain relatively flat and a slight slope up to the low lying mountains which bound the southwestern edge of the range. The B-16 Range Complex is open daily from 0715 to 2330 hours local time. Only inert ordnance can be used on B-16.

Sections 4.3.1, 4.3.2 and 4.3.3 present the modeled flight tracks, profile and sorties, and resultant noise exposure for the Baseline condition, respectively. Sections 4.3.4 and 4.3.5 present the modeled sorties and resultant noise exposure for the Prospective scenario, respectively.

4.3.1 Modeled Flight Tracks

The primary training activities in B-16 are bombing patterns to the convention bullseye utilizing a run-in line from the south at a magnetic heading of approximately 4 degrees east of magnetic north. There are three types of modeled bombing patterns depicted in Figure 4-4: High Dive, Low Dive, and Low Pop which includes a slight left or right approach to the bullseye.

4.3.2 Modeled Flight Profiles and Baseline Busiest Month Operations

The High Dive and Low Dive patterns both follow a racetrack-type pattern with pattern altitudes of 12,000 ft and 5,000 ft AGL. Upon the completion of the southern turn towards the bullseye aircraft begins a dive toward the target in order to release the practice bomb. The Low Pop pattern extends much further to the south allowing the aircraft to setup an approach to the target at an altitude of 200 ft AGL. Within approximately two miles from the target the aircraft performs a 'pop up' by rapidly increasing altitude to approximately 3,000 ft AGL and releasing the practice bomb. These maneuvers are shown in detail in Appendix A.

The total modeled sorties for the busiest month at B-16 are 166. Approximately 45 percent are attributed to the F/A-18C/D and the remaining 55 percent to the F/A-18E/F operations as shown in Table 4-7. High Dive and Low Dive account for the majority of events with 55 and 35 percent, respectively. Each sortie averages 6 target passes resulting in a total of 1,002 busiest month passes.

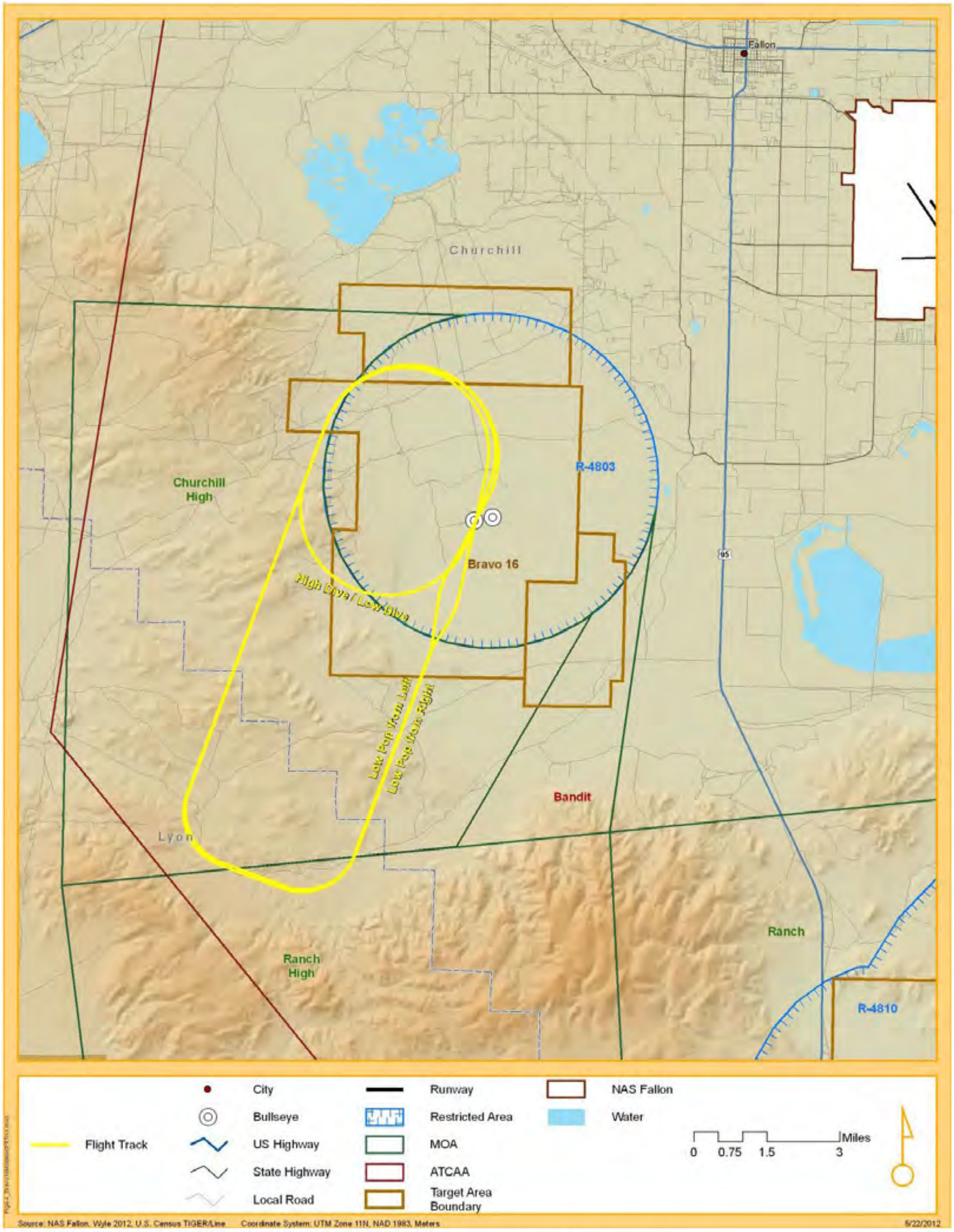

Figure 4-4 Modeled Bravo 16 Bombing Patterns

Table 4-7 Modeled Baseline Busiest Month Operations at B-16 Range

Aircraft	Maneuver	Maneuver percentages	Busy Month Sorties			Busy Month Passes		
			Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
FA-18C/D	High Dive	55%	37	4	41	222	24	246
	Low Dive	35%	24	2	26	144	12	156
	Low Pop left	5%	3	1	4	18	6	24
	Low Pop right	5%	3	1	4	18	6	24
FA-18E/F	High Dive	55%	44	5	49	270	30	300
	Low Dive	35%	29	3	32	174	18	192
	Low Pop left	5%	4	1	5	24	6	30
	Low Pop right	5%	4	1	5	24	6	30
Total			148	18	166	894	108	1,002

Notes:

(1) Modeled an average of 6 patterns per sortie

(2) All patterns flown to the Bravo 16 Conventional Bullseye

4.3.3 Baseline Noise Exposure

Using the data described in Sections 4.3.1 and 4.3.2, NOISEMAP was used to calculate the 60 dB through 85 dB DNL contours, in 5 dB increments, for the Baseline Bravo 16 events. The resulting L_{dnmr} contours for all FRTC aircraft operations combined are plotted in Figure 4-5 and zoomed to the Bravo 16 area. This study includes analysis utilizing both NOISEMAP and MR_NMAP. NOISEMAP computed DNL while MR_NMAP computed L_{dnmr} which includes an onset rate adjustment. There is a negligible difference between the two computed metrics for the portions of the flight profiles at the higher altitudes, which occur furthest off range. The lowest altitude portions of the flight profiles generate the largest difference between computed DNL and L_{dnmr} but this occurs on range in the vicinity of the target. The NOISEMAP DNL and MR_NMAP L_{dnmr} grids were combined with NMPLOT to approximate L_{dnmr} throughout the entire range including Bravo 16. The Bravo 16 contours will be referred to as L_{dnmr} for brevity.

The 65 dB L_{dnmr} contour follows the Low Pop flight track beginning at the turn to the final leg approximately 5 miles south of the Bravo 16 range boundary. Even though the Low Pop pattern is the least utilized maneuver it requires low altitudes down to 200 ft AGL along the final leg. This low altitude combined with a relatively high power setting is the reason it is the primary contributor to the L_{dnmr} contours outside of the Bravo 16 range boundary. The highly utilized High Dive and Low Dive maneuvers are the primary contributors to the 65 through 80 dB L_{dnmr} contours in the vicinity of the bullseye and the left turn near the northern boundary. The 65 dB L_{dnmr} extends less than 2,000 ft from the Bravo 16 northern range boundary. Although the 60 dB L_{dnmr} extends beyond the Bravo 16 boundary it does not affect any populated areas.

4.3.4 Prospective Operations

Consistent with changes discussed in Section 4.1.3, B-16 operations would also expect as transition from the F/A-18C/D to the F/A-18E/F for the Prospective FY2015 as well as an increase in operations of 10 percent relative to Baseline. In this particular case the B-16 Baseline busiest month sorties already reflected nearly 55 percent F/A-18E/F so there was no significant change to the modeled aircraft mix for the Prospective scenario. As tabulated in Table 4-8, a total of 183 busiest month sorties and 1,102 busiest month passes are estimated and modeled for FY2015.

There would not be any changes to the flight tracks or the flight profiles at B-16 for FY2015 relative to the Baseline scenario.

Table 4-8 Modeled Prospective Busiest Month Operations at B-16 Range

Aircraft	Maneuver	Maneuver percentages	Busy Month Sorties			Busy Month Passes		
			Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
FA-18A/B/C/D	High Dive	55%	40	5	45	244	27	271
	Low Dive	35%	26	3	29	157	15	172
	Low Pop left	5%	4	1	5	21	6	27
	Low Pop right	5%	4	1	5	21	6	27
FA-18E/F	High Dive	55%	49	6	55	298	33	331
	Low Dive	35%	31	3	34	192	18	210
	Low Pop left	5%	4	1	5	25	7	32
	Low Pop right	5%	4	1	5	25	7	32
Total			162	21	183	983	119	1,102

Notes:

(1) Modeled an average of 6 patterns per sortie

(2) All patterns flown to the Bravo 16 Conventional Bullseye

4.3.5 Prospective Noise Exposure

The Prospective noise contours for the all FRTC aircraft operations combined are plotted in Figure 4-6 which is zoomed to the Bravo 16 range area. The 65 dB L_{dnmr} contours would be similar to Baseline in terms of size and shape. L_{dnmr} would increase less than 1 dB along the Bravo 16 patterns. The 65 dB L_{dnmr} would remain approximately the same as Baseline and extend less than 4,000 further. Although the 60 dB L_{dnmr} would extend beyond the Bravo 16 boundary it would not affect any populated areas. The primary cause of the increase is the overall increase in operations of 10 percent across the entire FRTC. The secondary cause of the increase in L_{dnmr} is the transition from F/A-18C/D to the F/A-18E/F.

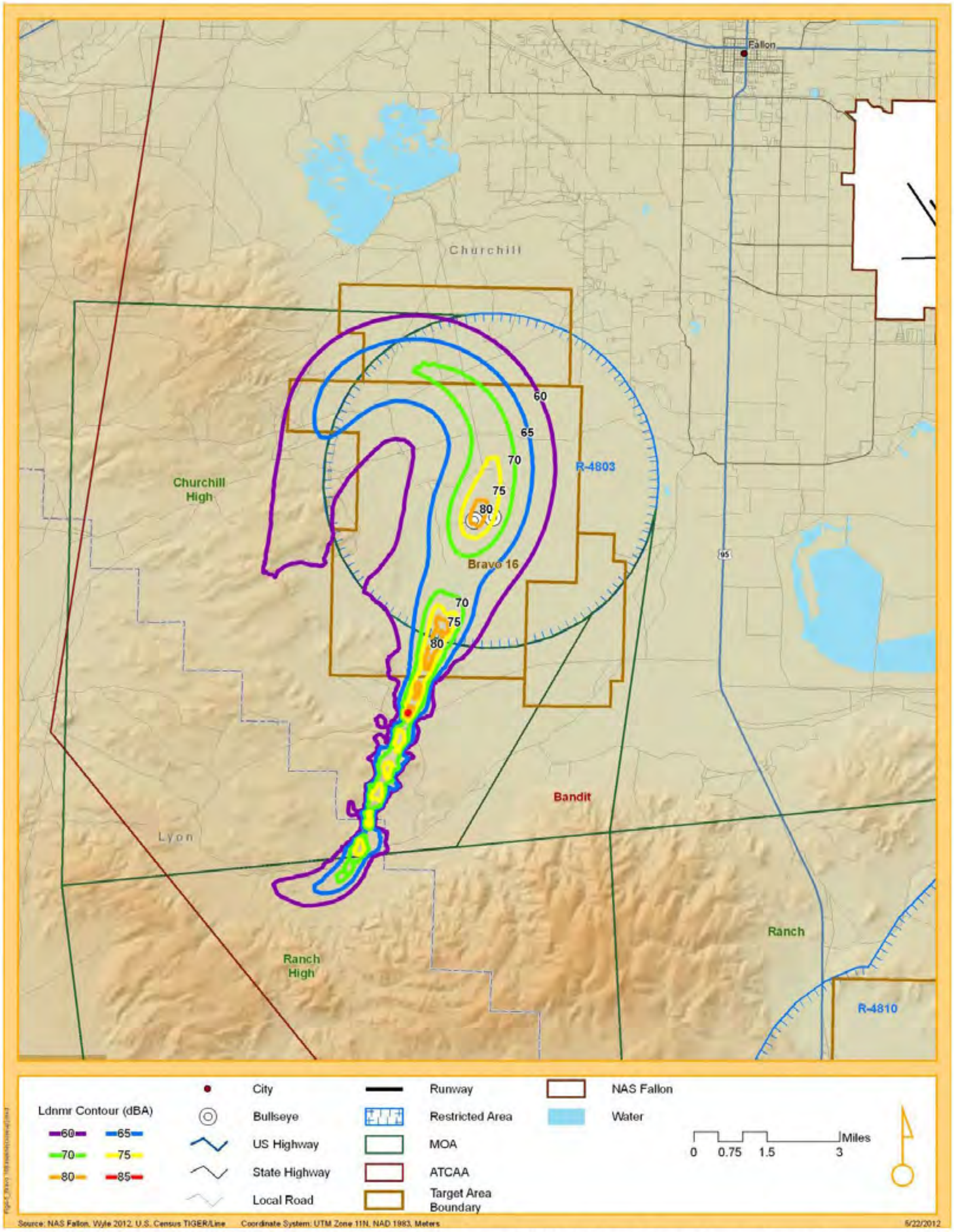

Figure 4-5 Estimated L_{dnmr} Contours for Baseline (FY2010) Aircraft Operations at Bravo 16

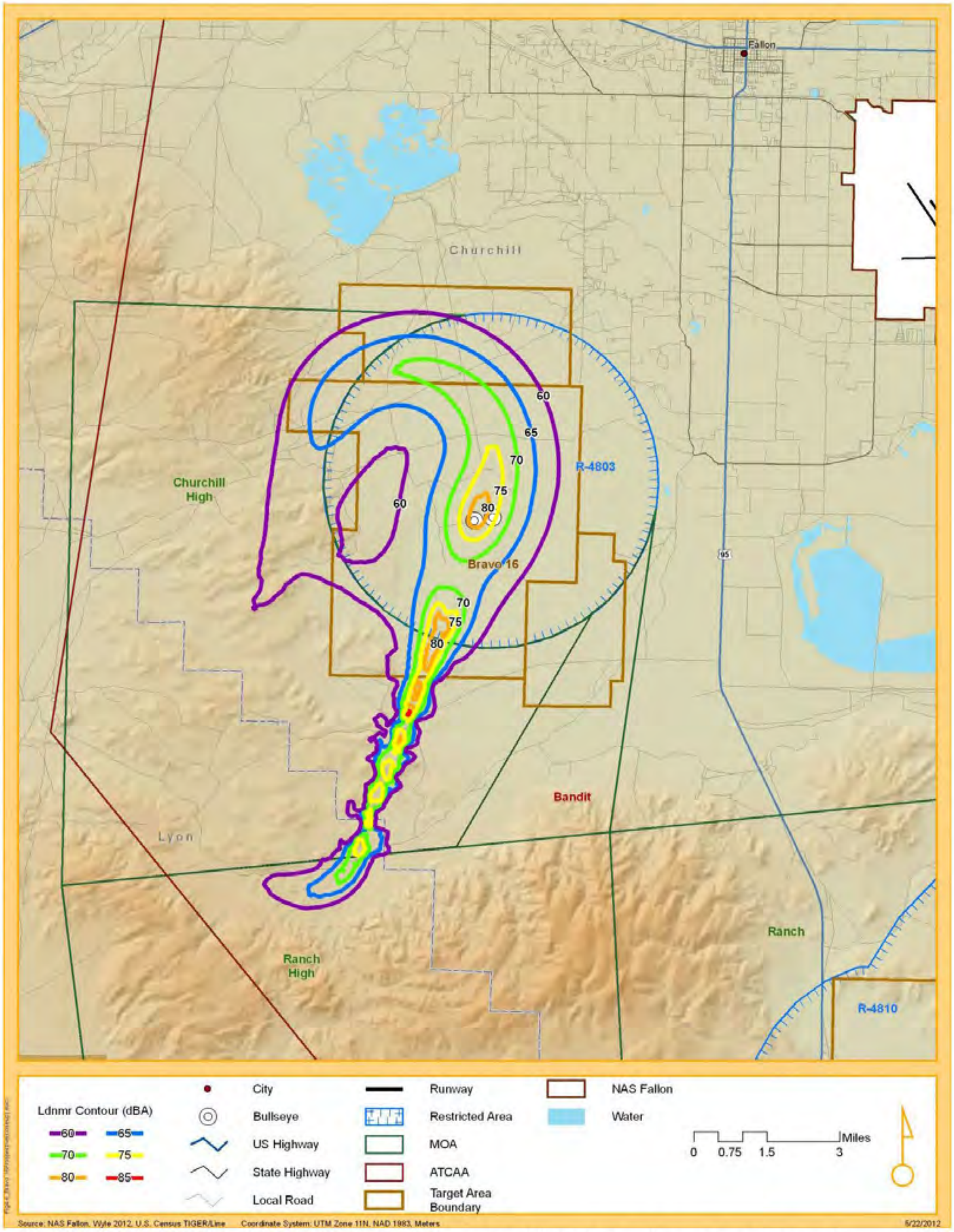

Figure 4-6 Estimated L_{dnmr} Contours for Prospective (FY2015) Aircraft Operations at Bravo 16

4.4 Bravo 17

The most frequently used range at FRTC, B-17, is located 25 miles east-southeast of NAS Fallon and south of U.S. Highway 50, as shown in Figure 4-7, at an elevation of approximately 4,200 feet MSL. B-17 is contained within the Restricted area R-4804 which extends from the surface to 35,000 feet MSL and overlies the range impact areas.

B-17 is comprised of four surface areas with various ground targets. The western portion of B-17 is comprised of No Drop Area (NDA) targets including an Army compound target; Scud missile target; laser billboard; a bridge target; the West Petroleum, Oil, and Lubricant (POL) Facility target; and a motor pool target. Ordnance expenditure is forbidden in this area.

The eastern portion B-17 includes the Light Inert Impact Area, the Heavy Inert Impact Area, and the Live Impact Area. The Light Inert Impact Area includes a conventional weapons bull's-eye target, a strafe target, an airfield complex, an air defense site, the East POL Facility, a headquarters compound, the East Power Plant target, a helicopter tank target, a tank convoy and cave entrance target, a Scud missile launcher, a convoy target, a command and control center, a Close Air Support (CAS) target that simulates a below-ground POL, and another CAS target that represents a below-ground building. The targets in the Light Inert Impact Area collectively accommodate expenditure of the following ordnance types: MK-76/BDU-33, MK-106/BDU-48, Laser Guided Training Round (LGTR), BDU-45, LUU-2 Paraflares and 2.75 FFAR (practice). Targets in the Light Inert Impact Area are Weapons Impact Scoring System (WISS) scored.

Forward Air Controller (FAC) platforms are designated areas from which approved artillery, small arms, and mortars are fired in support of CAS exercises. Each FAC position allows an unobstructed view of associated target areas. There is one FAC platform located within B-17 at the western edge of the Light Inert Area. There is also a helicopter Landing Zone (LZ) in addition to Drop Zone (DZ) Bad Monkey within B-17 to support CAS training

The Heavy Inert Impact Area is in the northeastern corner of the B-17 complex. This area includes three targets: an industrial site target, a surface-to-air (SAM) site target and a missile assembly target. All three of these targets accommodate expenditure of MK-76/BDU-33, MK-106/BDU-48, LGTR, MK-81 thru MK-84 practice ordnance, BDU-45, LUU-2 Paraflares and 2.75 FFAR (practice). Targets in the Heavy Inert Impact Area are WISS scored.

The High Explosive Impact (HEI) area is located in the southeastern section of the B-17 complex and allows expenditure of high explosive ordnance. The High Explosive Impact area contains numerous tank vehicle targets and a camouflaged cave entrance. Targets in the High Explosive Impact area are WISS scored (DoN 2006).

Sections 4.4.1, 4.4.2 and 4.4.3 present the aircraft modeled flight areas, operations, and flight profiles for Bravo 17 and resultant noise exposure for the Baseline condition. Sections 4.4.4 and 4.4.5 present the operations and resultant noise exposure for the Prospective scenario, respectively.

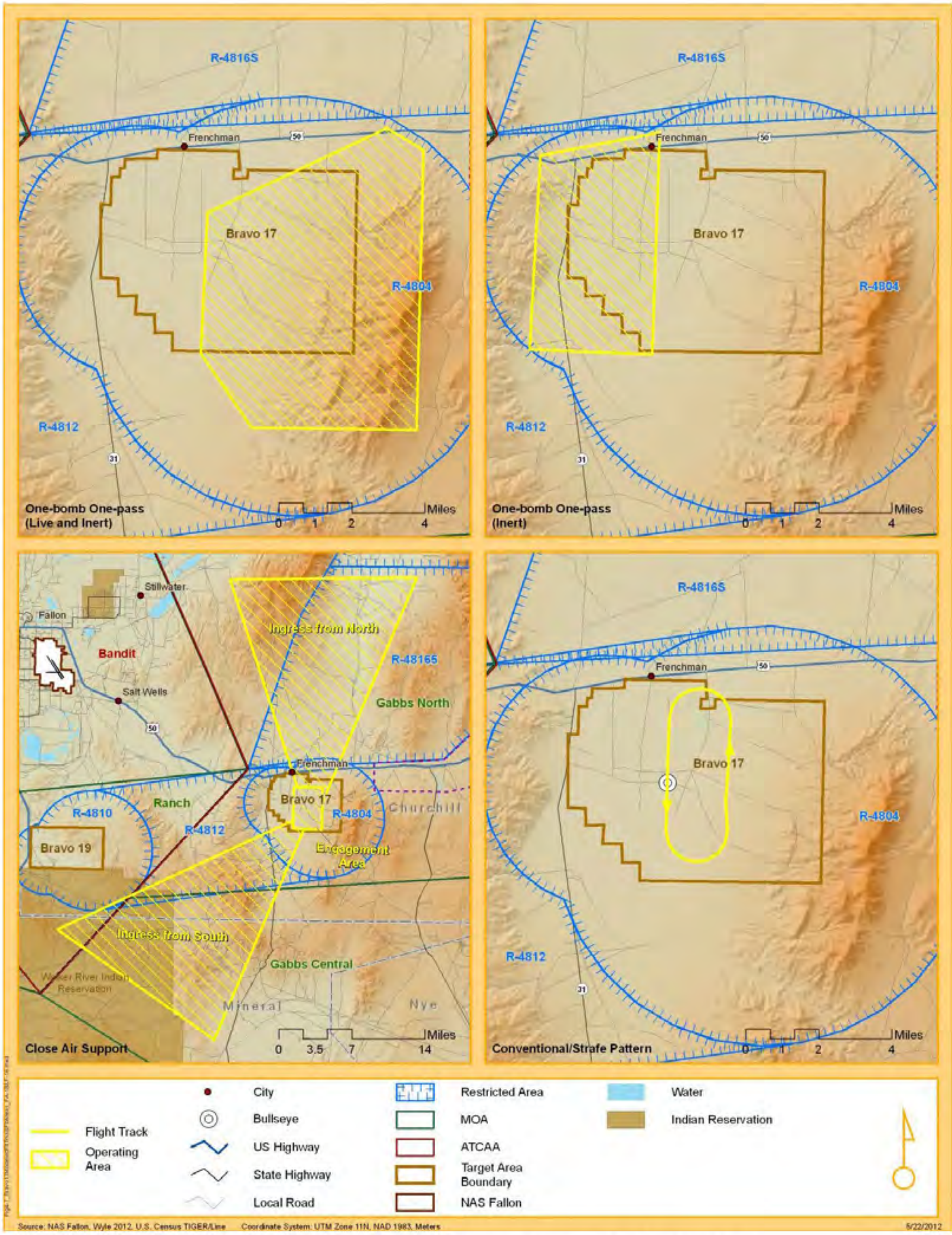

Figure 4-7 Bravo 17 Flight Tracks and Flight Areas for F/A-18 and F-16

4.4.1 Modeled Training Flight Areas and Baseline Operations

A total of three types of missions are conducted in the B-17 range by the F/A-18C/D, F/A-18E/F, and the F-16: One-bomb One-pass, Close Air Support (CAS) and Conventional and Strafe patterns. These missions were modeled and analyzed with a combination of typical flight areas and flight tracks with differing methods for each mission type. A total of 6,803 busiest month operations are modeled for training as listed in Table 4-9a. The F/A-18C/D and F/A-18E/F are the primary users of B-17 generating 46 and 39 percent of total busiest month sorties, respectively. Almost all operations occur during the daytime with only one percent during nighttime (2200-0700).

Table 4-9 Baseline Busiest Month Operations at Bravo 17 for F/A-18 and F-16

Mission Type	% of total Sorties	Description	%	Time in Area (min)	Reported Avg Power Setting (%NC or %RPM)	Reported Avg Airspeed (KIAS)	Reported Average Altitude (AGL)	F/A-18C/D			F/A-18E/F			F-16			Total
								Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	
								Area Operations									
One-bomb One-pass	40%	Heavy HE and Inert Area	50%	10	85-Mil	400-500	12-18k (25%) 18k-25k (50%) 25k-30k (25%)	306	3	309	260	3	263	32	-	32	604
		Light HE and Inert Area	50%	10	85-Mil	400-500	12-18k (25%) 18k-25k (50%) 25k-30k (25%)	306	3	309	260	3	263	32	-	32	604
Close Air Support	35%	Run-in from Southwest	100%	20	90	400	17k	535	5	540	456	5	461	57	1	58	1,059
		Run-in from North		20	90	400	17k										
		Engagement Area		20	90-Mil	400-450	7K-17K										
								Patterns									
Conv. and Strafe Patterns	25%	Conventional Pattern	50%	N/A	Mil	450	500-1k (50%)(1) 1k-3k (30%) 3k-9k (20%)	1,147	12	1,159	976	10	986	122	1	123	2,268
		Strafe Pattern	50%	N/A	90	400	500-1k (50%)(1) 1k-3k (30%) 3k-9k (20%)	1,147	12	1,159	976	10	986	122	1	123	2,268
Total								3,441	35	3,476	2,928	31	2,959	365	3	368	6,803

Notes:
(1) The minimum altitude of 500 ft to 1000 ft AGL only occurs in the vicinity of the target

<u>One-bomb One-pass</u>

The "One-bomb One-pass" mission is divided into two sub areas depicted in Figure 4-7: the Heavy Live and Inert Area and the Inert Area. This mission describes all the random operations flown into Bravo 17 for the purpose of delivering live or inert air-to-ground ordnance. These missions are generally flown above 12,000 feet AGL. Typical speeds and power settings are listed in Table 4-9a.

<u>CAS</u>

CAS missions are also divided into three sub-areas that are depicted in Figure 4-7: the two Run-in Areas and the Engagement Area. The run-in typically occurs from any number of control points southwest of the target or from north of the target. The run-in portion of these missions is generally flown above 17,000 feet AGL, while target engagement occurs between 7,000 feet AGL and 17,000 feet AGL as listed in Table 4-9a along with typical speeds and power settings.

Conventional/Strafe Pattern

The Conventional/Strafe Pattern in Bravo 17 is a left-traffic racetrack pattern around two co-located targets: a Conventional Bull and a Strafe Target. The downwind portion of the profile begins on the eastern side of the racetrack at an altitude of 3,000 feet AGL with the aircraft heading north. The start of the dive begins as the aircraft turns left and reaches the lowest altitude near the targets at 500 feet AGL, followed by a climb to 3,000 feet AGL returning to downwind. Typical speeds and power settings are listed in Table 4-9a. Aircraft conduct an average of 6 passes per sortie.

4.4.2 Modeled Support Flight Areas and Baseline Operations

The F-5 operates in a supporting role to other aircraft and as a result utilizes different flight areas from the training aircraft. For Baseline the F-5 conducts 124 busiest month operations at Bravo 17 as listed in Table 4-9b. Approximately 99 percent occur during L_{dnmr} daytime and the remaining 1 percent during L_{dnmr} nighttime.

Support

Support mission describes all the random F-5 operations flown into the Bravo 17 area for the purpose of supporting various range exercises and is depicted in Figure 4-8. Although Support missions can be flown down to 500 feet AGL, the frequency of such occurrences is low (10 percent) and the majority of these missions are flown above 11,000 feet AGL. The typical F-5 speed and power setting is listed in Table 4-9b.

Table 4-9b Baseline Busiest Month Operations at Bravo 17 for F-5

Mission Description	% of Operations	Time in Area (min)	Reported Power Setting (%NC)	Reported Average Air speed (KIAS)	Average Altitude (AGL)	Day (0700-2200)	Night (2200-0700)	Total
Suport	100%	5	MIL	350	0.5K-11K (10%) 11K-18K (55%) 18K-30K (35%)	123	1	124
Total						123	1	124

4.4.3 Modeled Helicopter Flight Tracks, Areas and Baseline Operations

H-60 helicopters conduct CAS and Naval Special Warfare (NSW) missions in B-17 for a total of 1,190 busiest month operations as shown in Table 4-9c. All operations occur during L_{dnmr} daytime.

CAS (helicopter)

The CAS mission for H-60 helicopters is divided into multiple areas and tracks depicted in Figure 4-9. H-60 CAS operations in Bravo 17 start with a clearing turn, followed by positioning within one of the two holding areas to the north or to the south. From the holding areas, approximately eight passes per sortie are conducted to the targets, with left and right turns back to the holding areas.

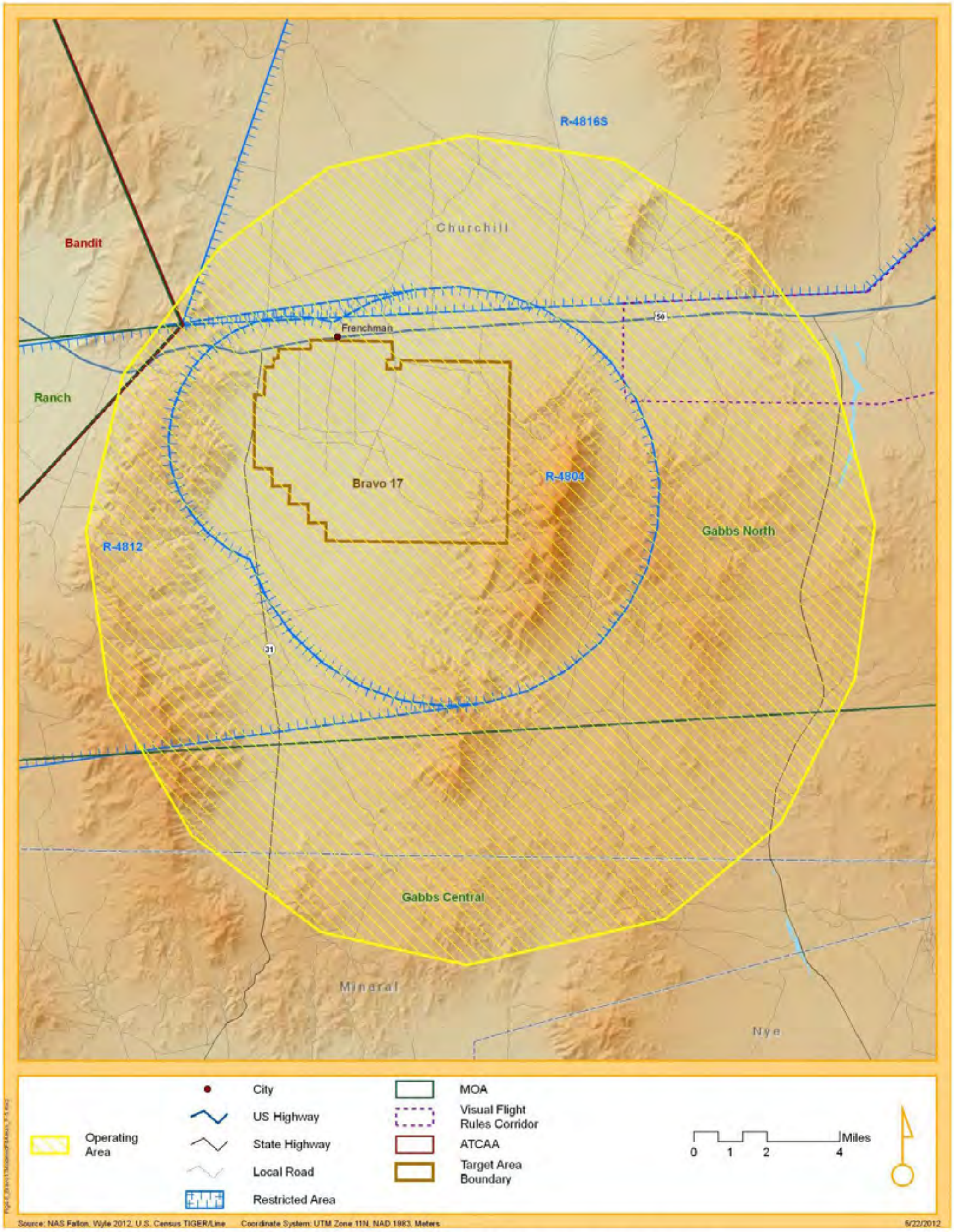

Figure 4-8 Modeled Flight Area for F-5 Operations at Bravo 17

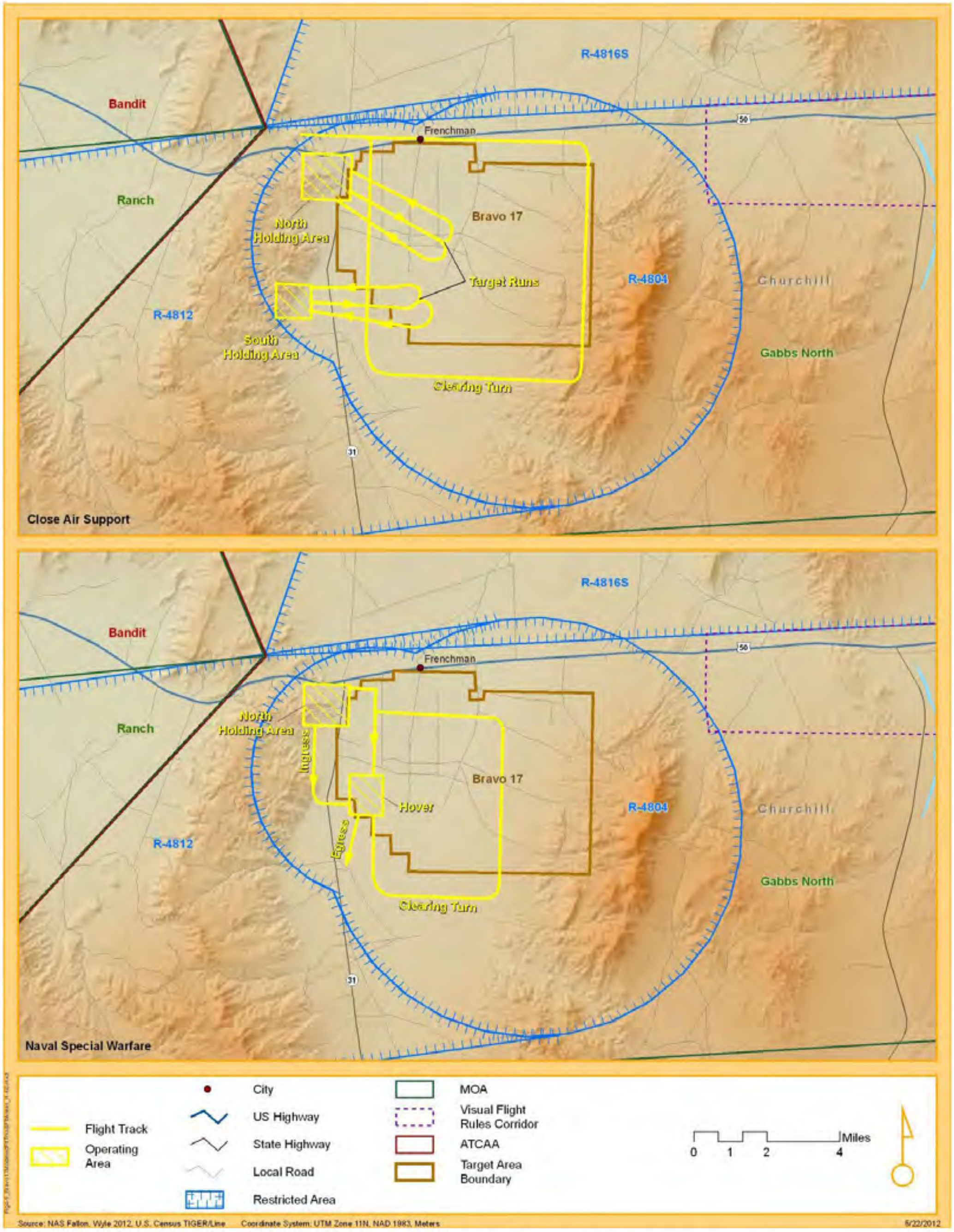

Figure 4-9 Modeled Flight Tracks and Areas for H-60 Operations at Bravo 17

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Table 4-9c Baseline Busiest Month Flight Operations at Bravo 17 for H-60

Mission	Percent of Sorties	Sorties	Event Description	Number of Runs per Sortie	Time in Area (min)	Reported Average Airspeed (KIAS)	Reported Average Altitude (AGL)	H-60 Operations		
								Day (0700-2200)	Night (2200-0700)	Total
Close Air Support	60%	31	Initial Clearing Turn	1	n/a	60-70	200-300	31	-	31
			North Holding Area	n/a	55	0	200-300	31	-	31
			South Holding Area		55	0	200-300	31	-	31
			North Run Left Turn	8	n/a	60-70	200-300	248	-	248
			North Run Right Turn	8		60-70	200-300	248	-	248
			South Run Left Turn	8		60-70	200-300	248	-	248
			South Run Right Turn	8		60-70	200-300	248	-	248
Naval Special Warfare	40%	21	Initial Clearing Turn	1	n/a	100-120	100-200	21	-	21
			Holding Area	n/a	55	0	100-200	21	-	21
			Ingress to Army Combat Village	1	n/a	100-120	100-200	21	-	21
			Hover at Army Combat Village Area	n/a	3	0	70	21	-	21
			Egress from Army Combat Village Area	1	n/a	100-120	100-200	21	-	21
Total		52						1,190	-	1,190

NSW (helicopter)

The NSW mission is also divided into multiple areas and tracks as depicted in Figure 4-9. H-60 aircraft conducting NSW operations in Bravo 17 conduct a clearing turn of the range, followed by positioning within the north holding area. From the holding area, the helicopters ingress into the Army Combat Village where hovering operations are conducted. At the end of the mission, the aircraft egress out of Bravo 17 via a southwest route. H-60 NSW missions are generally flown between 100 and 200 feet AGL, but because their number of operations is relatively infrequent, their contribution to the overall noise environment is minimal.

4.4.4 Baseline Noise Exposure

Using the data described in Sections 4.4.1 through 4.4.3, MR_NMAP was used to calculate the 60 dB through 85 dB L_{dnmr} contours, in 5 dB increments, for the Baseline Bravo 17 events. The resulting L_{dnmr} contours for all FRTC aircraft operations combined are plotted in Figure 4-10 and zoomed to the Bravo 17 area. The contours closely follow the Conventional and Strafe pattern due to the F/A-18 and F-16 patterns flown at relatively low altitudes of 3,000 feet AGL along downwind down to 500 feet AGL near the bullseye. The 65 dB and 60 dB L_{dnmr} contours would extend less than 4,000 ft and 9,000 ft, respectively, beyond the Bravo 17 range boundary. Although the 65 dB L_{dnmr} appears to encompass the city of Frenchman on Figure 4-7, a review of aerial photography suggests that no residential structures are included within the 65 dB L_{dnmr} contours so no populated areas are affected.

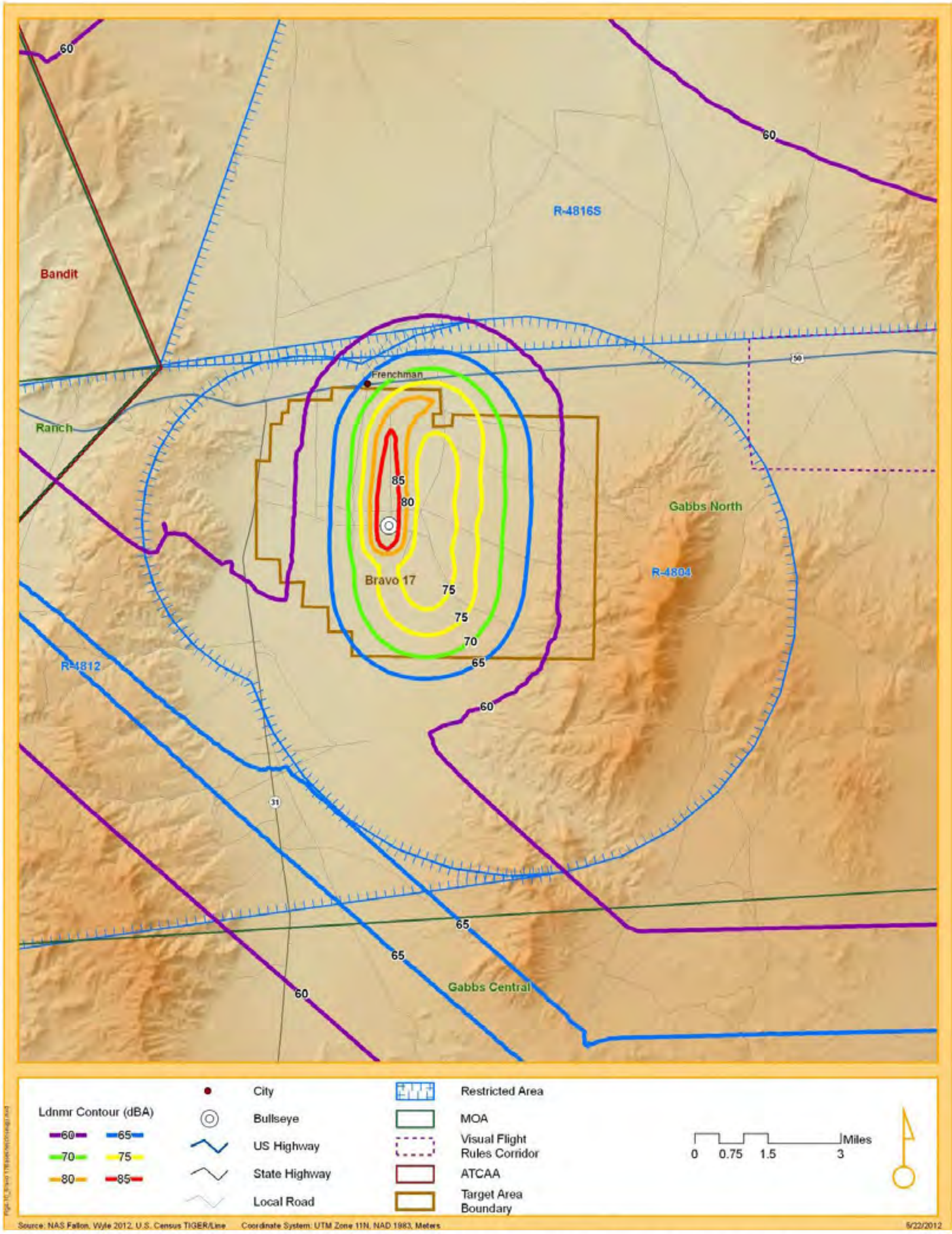

Figure 4-10 L_{dnmr} Contours for Baseline (FY2010) Aircraft Operation at Bravo 17

4.4.5 Prospective Operations

The Prospective scenario for B-17 would include the same FRTC-wide changes discussed in Section 4.2.3. The F/A-18C/D and F/A-18E/F scenario would remain the top users with 39 and 47 percent of all B-17 operations, respectively. The portion of operations occurring during nighttime (2200-0700) would remain at one percent.

The Prospective scenario modeled busiest month training operations would total 7,484 as shown in Table 4-10a.

Table 4-10a Prospective Busiest Month Operations at Bravo 17 for F/A-18 and F-16

Mission Type	Description	F/A-18C/D			F/A-18E/F			F-16			Total
		Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	
Area Operations											
One-bomb One-pass	Heavy HE and Inert Area	280	3	283	343	3	346	36	-	36	665
	Light HE and Inert Area	280	3	283	343	3	346	36	-	36	665
Close Air Support	Run-in from Southwest Run-in from North Engagement Area	491	5	496	599	6	605	62	1	63	1,164
Passes											
Conventional and Strafe Patterns	Conventional Pattern	1,051	11	1,062	1,285	13	1,298	134	1	135	2,495
	Strafe Pattern	1,051	11	1,062	1,285	13	1,298	134	1	135	2,495
Total		3,153	33	3,186	3,855	38	3,893	402	3	405	7,484

Notes:
(1) The minimum altitude of 500 ft to 1000 ft AGL only occurs in the vicinity of the target

As shown in Tables 4-10b and 4-10c, the F-5 and H-60 operations would increase by 10 percent relative to Baseline to a total of 136 support operations and 1,309 operations, respectively. There would not be any changes to the flight tracks or the flight profiles in B-17 for the FY2015 scenario.

Table 4-10b Prospective Busiest Month Operations at Bravo 17 for F-5

Mission Description	Day (0700-2200)	Night (2200-0700)	Total
Support	135	1	136
Total	135	1	136

Table 4-10c Prospective Busiest Month Flight Operations at Bravo 17 for H-60

Mission	Event Description	H-60 Operations Day (0700-2200)	Night (2200-0700)	Total
Close Air Support	Initial Clearing Turn	34	-	34
	North Holding Area	34	-	34
	South Holding Area	34	-	34
	North Run Left Turn	273	-	273
	North Run Right Turn	273	-	273
	South Run Left Turn	273	-	273
	South Run Right Turn	273	-	273
Naval Special Warfare	Initial Clearing Turn	23	-	23
	Holding Area	23	-	23
	Ingress to Army Combat Village	23	-	23
	Hover at Army Combat Village Area	23	-	23
	Egress from Army Combat Village Area	23	-	23
Total		1,308	-	1,308

4.4.6 Prospective Noise Exposure

The Prospective noise contours for the all FRTC aircraft operations combined are plotted in Figure 4-11 which is zoomed to the Bravo 17 range area. The 65 dB L_{dnmr} contours are very similar to Baseline in terms of size and shape. L_{dnmr} would increase less than 1 dB along the Bravo 17 patterns. The 65 dB and 60 dB L_{dnmr} would remain approximately the same as Baseline and extend less than 1,000 ft further. The primary cause of the increase is the overall increase in operations of 10 percent across the entire FRTC. The secondary cause of the increase in L_{dnmr} is the transition from F/A-18C/D to the F/A-18E/F.

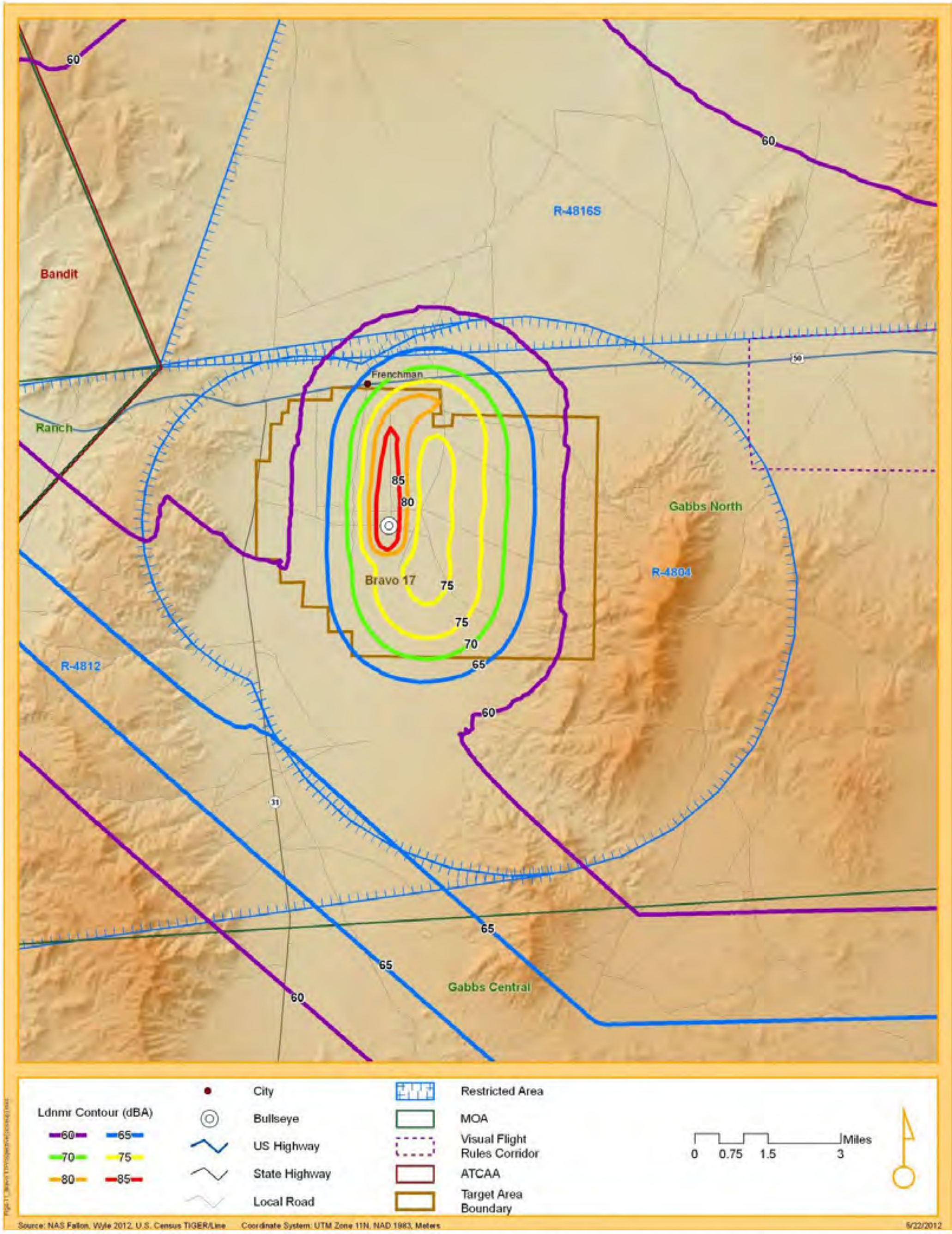

Figure 4-11 L_{dnmr} Contours for Prospective (FY2010) Aircraft Operation at Bravo 17

4.5 Bravo 19

R-4810 associated with Bravo-19, extends from the surface to 17,000 feet MSL and overlies the range impact areas. The B-19 area is comprised of alkali flats with areas of patchy desert sand sparsely vegetated by sagebrush. This target complex, which lies 16 nautical miles (nm) south-southeast of NAS Fallon at an elevation of 3,882 feet MSL, consists of a strafe target with an acoustic transducer, a HEI area and a helicopter strafe area. Night lighting is provided for the bull target. The HEI area is also designated as an alternate ordnance jettison area. There are two FAC platforms in B-19 to support CAS training, one on the tower road and one at the east tower.

The targets within B-19 accommodate expenditure of MK-76/BDU-33, MK-106, BDU-48, LGTR, 2.75 FFAR (practice), LUU-2 Paraflares, BDU-45, 20mm TP, 25mm TP, 30mm TP, 7.62mm, 5.56mm, .50 cal (no HEI), 5.0 Zuni (practice), MK-80 series (live and practice Laser Guided Bombs [LGB]), 20mm HEI, and MK-77 (Napalm) (DoN 2006).

Sections 4.5.1, 4.5.2 and 4.5.3 present the aircraft modeled flight areas, operations, and flight profiles for Bravo 19 and resultant noise exposure for the Baseline condition. Sections 4.5.4 and 4.5.5 present the operations and resultant noise exposure for the Prospective scenario, respectively.

4.5.1 Modeled Training Flight Areas and Baseline Operations

Two types of training missions are conducted by fixed-wing aircraft in B-19 and the modeled flight tracks and flight areas are depicted on Figure 4-12. F/A-18C/D, F/A-18E/F and F-16 missions within B-19 include Circle the Wagon (CW) and Close Air Support (CAS). Table 4-11a provides a description of each portion of the missions and the applicable modeling parameters such as time, number of passes per mission, average power settings, average airspeed and altitude distribution. A total of 4,155 training operations were modeled. The F/A-18C/D and F/A-18E/F account for the majority of all B-19 operations with 42 and 45 percent, respectively. Almost all operations occur during the daytime with only one percent during nighttime (2200-0700).

Table 4-11a Baseline Busiest Month Flight Operations at Bravo 19 for F/A-18C/D, F/A-18E/F and F-16

Mission	Percent of Operations	Event Description	Track or Area Use	Time in Area (min)	Passes per sortie	Avg Power Setting (%NC or %RPM)	Average Airspeed (KIAS)	Average Altitude (AGL)	F/A-18C/D			F/A-18E/F			F-16			Total		
									Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
Circle the Wagon	50%	North Run-in (west Pattern)	25%		6	90-Mil	350-450	7K-15K	240	2	242	260	3	263	36	1	37	536	6	542
		North Run-in (center Pattern)	25%		6	90-Mil	350-450	7K-15K	240	2	242	260	3	263	36	1	37	536	6	542
		North Run-in (East Pattern)	25%		6	90-Mil	350-450	7K-15K	240	2	242	260	3	263	36	1	37	536	6	542
		West Run-in	25%		6	90-Mil	350-450	7K-15K	240	2	242	260	3	263	36	1	37	536	6	542
CAS	50%	Holding Track	50%		10	80-90	350	15K	799	9	808	866	9	875	121	2	123	1,786	20	1,806
		Close Air Support Area	50%	5		90-Mil	350-450	7K-15K	80	1	81	87	1	88	12	-	12	179	2	181
Total									1,839	18	1,857	1,993	22	2,015	277	6	283	4,109	46	4,155

Notes:

(1) Close Air Support operations modeled with a sortie duration of 5 minutes

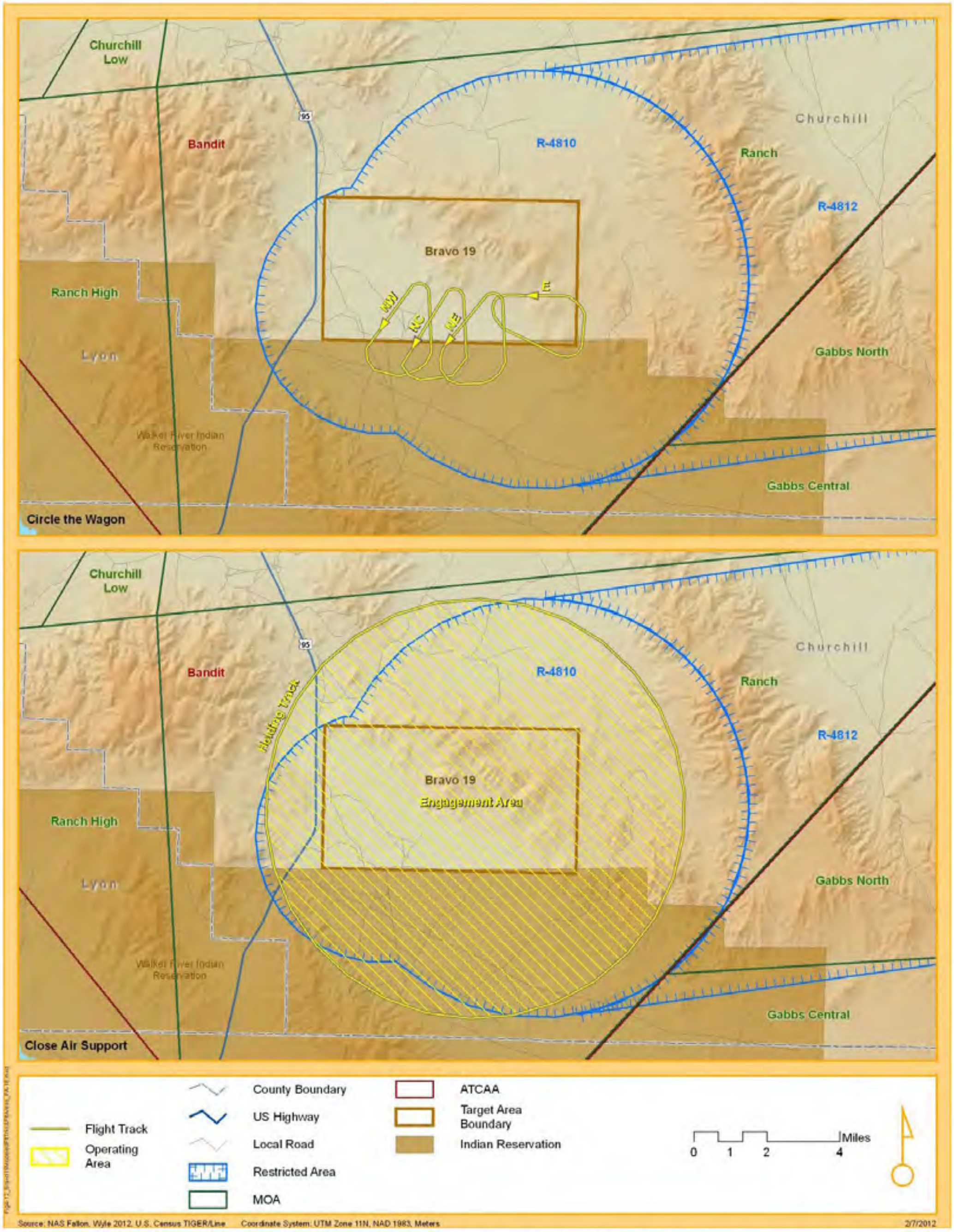

Figure 4-12 Modeled Flight Tracks and Areas for F/A-18 and F-16 Operations at Bravo 19

CW

CW missions include the use of four tracks depicted in Figure 4-12: the western (NW), center (NC) and eastern (NE) tracks have a north run-in, while the most eastern pattern (E) has a west run-in. All patterns utilize left-hand traffic. Figure 4-12 shows a portion of the profile beginning on the "base leg" of the attack at an altitude of 15,000 feet AGL (C), continuing toward the target to the "bottom-out" altitude during the dive of 7,000 feet AGL (A), followed by a climb to the "downwind leg" altitude of 15,000 feet AGL (B). A similar profile is utilized by all four representative tracks shown.

CAS

The CAS mission profile is divided into one track and one area, both depicted in Figure 4-12: the holding track in coincident with the outer edge of the engagement area. The holding track serves as the initial point of any run-in to targets within Bravo 19 and is typically flown at 15,000 feet AGL. Aircraft ingress to designated targets within Bravo 19 at altitudes between 7,000 feet AGL and 15,000 feet AGL. CAS missions within Bravo 19 are not conducted below 7,000 feet AGL.

4.5.2 Modeled Support Flight Areas and Baseline Operations

F-5 operations in Bravo 19 support the training operations and totaled only two sorties during the busiest month of FY2010 for Baseline. According to NSAWC personnel, these operations occurred at altitudes above 15,000 feet AGL. Based on the low number of operations and the high altitudes at which they are conducted, F-5 operations would not contribute significantly to the overall noise environment at B-19 and thus were not modeled.

4.5.3 Modeled Helicopter Flight Tracks, Areas and Baseline Operations

H-60 missions within Bravo 19 include air-to-ground (AG) operations, Combat Search and Rescue (CSAR), and CAS/Maritime Air Support (MAS) operations. Table 4-11b provides a description of each mission event and the applicable modeling parameters such as time, number of passes per missions, average power settings, average airspeed and altitude distribution. A total of 104 H-60 operations derived from 19 sorties during the busiest month of FY2010. Figure 4-13 depicts the modeled flight tracks and flight areas for the different missions flown by H-60 helicopters within Bravo 19.

Air-to-Ground (AG)

AG missions consist of tracks and areas depicted in Figure 4-13: the northern east-to-west track, the clearing track, the Holding Area, and the ingress and egress tracks to the Air-to-Ground (AG) Pattern. H-60 helicopters typically fly a clearing track then proceed to the holding area. From the holding area, the aircraft fly northwest to the AG pattern. For a typical operation, 10 passes around the AG pattern are conducted before the aircraft exit Bravo 19. The AG pattern is flown at 200 feet AGL.

CSAR

CSAR missions are conducted on the northern AG track and they consist of two roundtrips in the west-to-east direction and back. The CSAR mission is flown between 100 and 200 feet AGL.

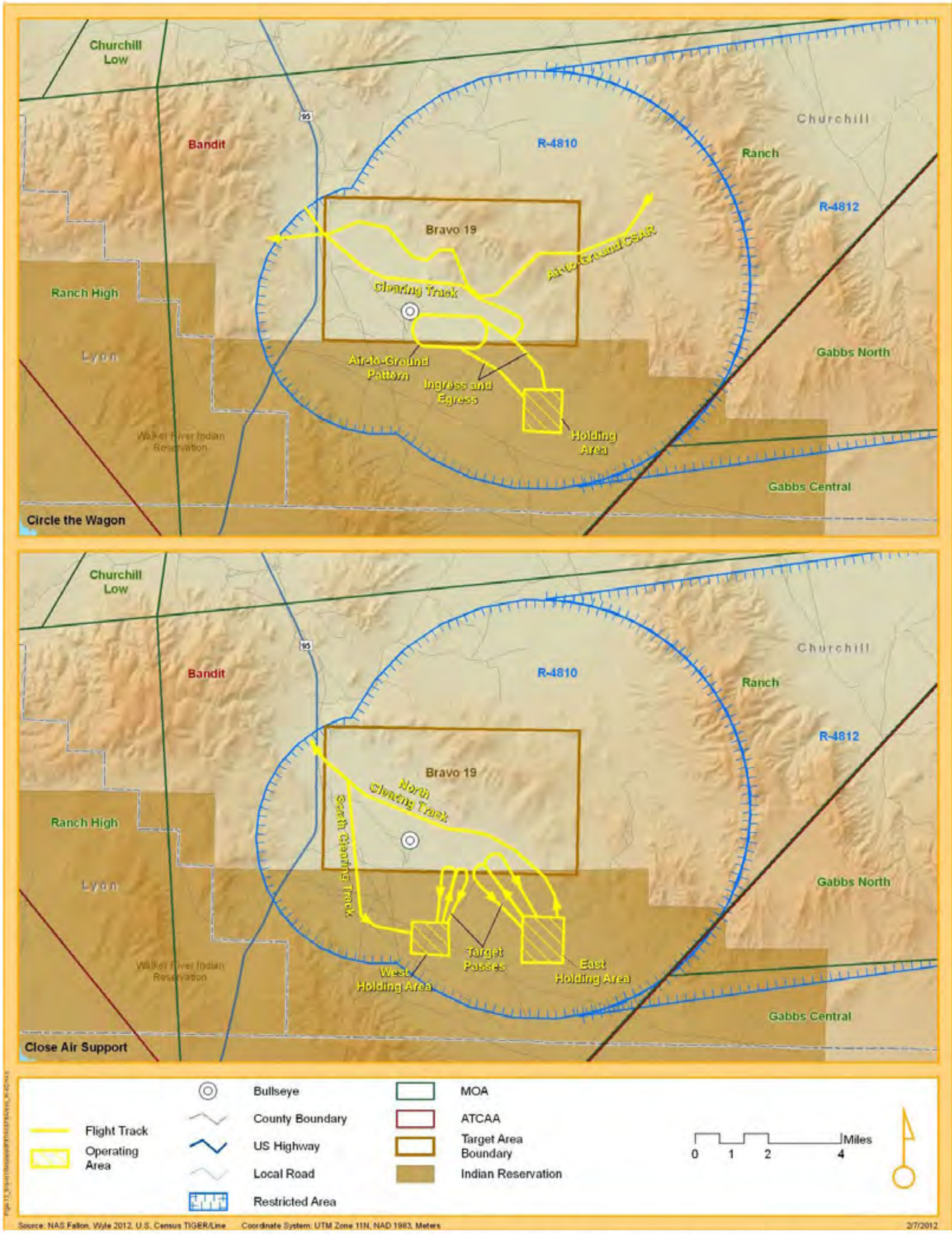

Figure 4-13 Modeled Flight Tracks and Areas for H-60 Operations at Bravo 19

Table 4-11b Baseline Busiest Month Flight Operations at Bravo 19 for H-60

Mission	Percent of Sorties	Sorties	Event Description	Number of Runs per sortie	Time in Area (min)	Reported Average Airspeed (KIAS)	Reported Average Altitude (AGL)	H-60 Operations		
								Day (0700-2200)	Night (2200-0700)	Total
Air-to-Ground	50%	10	North Air-to-Ground Route	4	N/A	80	100-200	5	-	5
			Initial Clearing Turn	1	N/A	100	200	5	-	5
			Holding Area (30min)	N/A	55	100	200	5	-	5
			Ingress to Pattern from Holding Area	1	N/A	100	200	5	-	5
			Air-to-Ground Pattern (30 min for 10 runs)	10	N/A	100	200	5	-	5
			Egress from Pattern to Holding Area	1	N/A	100	200	5	-	5
CSAR	10%	2	CSAR Track	4	N/A	80	100-200	2	-	2
CAS/MAS	40%	7	Initial Clearing Turn North	1	N/A	60-70	200-300	8	-	8
			Initial Clearing Turn South	1	N/A	60-70	200-300	8	-	8
			West Holding Area	N/A	55	0	200-300	8	-	8
			East Holding Area	N/A	55	0	200-300	8	-	8
			Transition Route	1	N/A	60-70	200-300	8	-	8
			East Run Left Turn	8	N/A	60-70	200-300	8	-	8
			East Run Right Turn	8	N/A	60-70	200-300	8	-	8
			West Run Right Turn	8	N/A	60-70	200-300	8	-	8
			West Run Left Turn	8	N/A	60-70	200-300	8	-	8
Total								104	-	104

CAS/MAS

The CAS/MAS mission is also divided into multiple areas and tracks depicted in Figure 4-13. H-60 aircraft conducting CAS/MAS operations in Bravo 19 fly clearing tracks (1) or (2), followed by positioning in one of two holding areas (3) and (4). The aircraft then conduct passes using left- or right-hand patterns against targets within Bravo 19 (5). H-60 CAS/MAS missions are generally flown between 200 and 300 feet AGL.

4.5.4 Baseline Noise Exposure

Using the data described in Sections 4.5.1 through 4.5.3, MR_NMAP was used to calculate the 60 dB through 85 dB L_{dnmr} contours, in 5 dB increments, for the Baseline Bravo 19 events. The resulting L_{dnmr} contours for all FRTC aircraft operations combined do not reach or exceed 60 dB. This is due to the low number of events and the relatively high altitude of 7,000 to 15,000 feet AGL for fixed-wing operations. Even though the helicopters operate at altitudes of 100 to 300 feet AGL, their numbers of operations combined with their single-event noise levels are insufficient to generate an L_{dnmr} of 60 dB or greater.

4.5.5 Prospective Operations

The Prosective scenario for B-19 would include the same FRTC-wide changes discussed in Section 4.1.3. The F/A-18C/D and F/A-18E/F would remain the top users with 40 and 48 percent of all B-19 operations, respectively.

The Prospective modeled busiest month training operations would total 4,556 as shown in Table 4-12a.

Table 4-12a Prospective Busiest Month Flight Operations at Bravo 19 for F/A-18C/D, F/A-18E/F, and F-16

Mission	Event Description	F/A-18C/D			F/A-18E/F			F-16			Total		
		Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
Circle the Wagon	North Run-in (west Pattern)	246	2	248	302	3	305	40	1	41	588	6	594
	North Run-in (center Pattern)	246	2	248	302	3	305	40	1	41	588	6	594
	North Run-in (East Pattern)	246	2	248	302	3	305	40	1	41	588	6	594
	West Run-in	246	2	248	302	3	305	40	1	41	588	6	594
CAS	Holding Track	819	9	828	1007	11	1018	134	1	135	1960	21	1981
	Close Air Support Area	82	1	83	101	1	102	13	1	14	196	3	199
Total		1885	18	1903	2316	24	2340	307	6	313	4508	48	4556

The two busiest month F-5 operations would increase by 10 percent relative to Baseline and would remain negligible in terms of their contribution to the overall noise environment and were not modeled. The H-60 operations would also increase by 10 percent relative to Baseline to a total of 119 operations as shown in Table 4-12b.

There would not be any changes to the flight tracks or the flight profiles in B-19 for FY2015.

Table 4-12b Prospective Busiest Month Flight Operations at Bravo 19 for H-60

Mission	Event Description	H-60 Operations		
		Day (0700-2200)	Night (2200-0700)	Total
Air-to-Ground	North Air-to-Ground Route	6	-	6
	Initial Clearing Turn	6	-	6
	Holding Area (30min)	6	-	6
	Ingress to Pattern from Holding Area	6	-	6
	Air-to-Ground Pattern (30 min for 10 runs)	6	-	6
	Egress from Pattern to Holding Area	6	-	6
CSAR	CSAR Track	2	-	2
CAS/MAS	Initial Clearing Turn North	9	-	9
	Initial Clearing Turn South	9	-	9
	West Holding Area	9	-	9
	East Holding Area	9	-	9
	Transition Route	9	-	9
	East Run Left Turn	9	-	9
	East Run Right Turn	9	-	9
	West Run Right Turn	9	-	9
	West Run Left Turn	9	-	9
Total		119	-	119

4.5.6 Prospective Noise Exposure

The Prospective noise exposure in the vicinity of Bravo 19 would not equal or exceed 60 dB L_{dnmr} due to the relatively low numbers of events and high operating altitudes.

4.6 Bravo 20

R-4813 associated with Bravo-20, extends from the surface to 35,000 feet MSL and overlies the range impact areas as shown in Figure 4-14. The B-20 area is 31 nm north-northeast of NAS Fallon at an elevation of 4,040 feet MSL at the center of the target area. The adjacent flats are at 3,890 feet MSL. Drainage in the area surrounding this range is very poor, often leading to extensive areas of shallow surface water surrounding many of the target sites after heavy rains.

The targets within B-20 accommodate expenditure of MK-76/BDU-33, MK-106, BDU-48, LGTR, 2.75 FFAR (practice), LUU-2 Paraflares, BDU-45, 20mm TP, 25mm TP, 30mm TP, 7.62mm, .50 cal (no HEI), 5.0 Zuni (practice), MK-80 series (live and practice LGB), MK-77 (Napalm), JDAM, and AGM-114 (Hellfire) (DoN 2006).

Sections 4.6.1, 4.6.2 and 4.6.3 present the aircraft modeled flight areas, operations, and flight profiles for Bravo 17 and resultant noise exposure for the Baseline condition. Sections 4.6.4 and 4.6.5 present the Prospective operations and resultant noise exposure for the Prospective scenario, respectively.

4.6.1 Modeled Training Flight Areas and Baseline Operations

F/A-18 and F-16 missions within Bravo 20 include Basic Fighter Maneuvers (BFM), Air-to-Ground (AG) missions, and Conventional/Strafe patterns. Table 4-13a provides a description of each mission and the applicable modeling parameters such as time, number of passes per mission, average power settings, average airspeed and altitude distribution. Figure 4-14 depicts the different missions flown by F/A-18 and F-16 aircraft. A total of 2,672 busiest month training operations were modeled. The F/A-18C/D and F/A-18E/F account for the majority of all B-20 operations with 39 and 34 percent, respectively. Almost all operations occur during the daytime with only one percent during nighttime (2200-0700).

Table 4-13a Baseline Busiest Month Operations at Bravo 20 for F-18C/D, F-18E/F and F-16

Mission	Mission %	Description	Pass per Sortie	Time in Area (min)	Reported Avg Power Setting (%NC or %RPM)	Reported Average Airspeed (KIAS)	Reported Altitude (AGL)	F/A-18C/D			F/A-18E/F			F-16			Total
								Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	
								Area Operations									
BFM	15%	Setup and Engagement Area		30	A/B	225-400	5K-20K	62	0	62	54	0	54	17	0	17	**133**
Air-to-Ground	60%	Area A - FRS		20	90-Mil	350-450	7K-15K (High [50%]) 0.5K-3K (Low[50%])	247	3	250	214	3	217	68	0	68	**636**
								Passes									
Conventional / Strafe Pattern	25%	South Strafe (50%)	9		85%	400-450	1k-3k, 5K-9K	463	5	468	402	4	406	127	1	128	**1,002**
		South Conventional (50%)	9		85%	400-450		463	5	468	402	4	406	127	1	128	**1,002**
Total								1,236	13	1,249	1,072	11	1,083	339	2	341	2,672

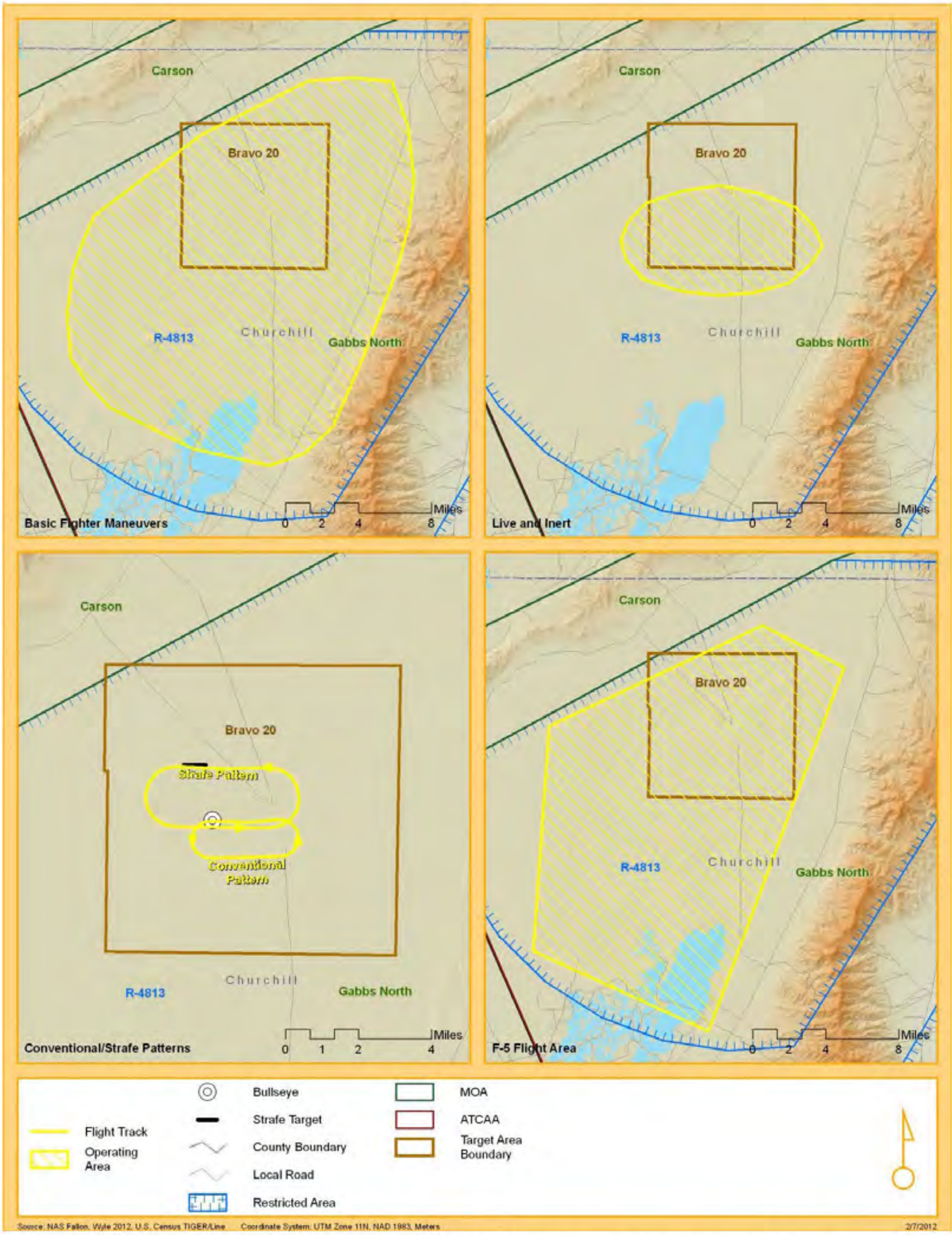

Figure 4-14 Modeled Flight Tracks and Areas for F/A-18, F-16 and F-5 Operations at Bravo 20

BFM

BFM missions are conducted above Bravo 20 oriented in a northeast/southwest direction (Figure 4-14). The most southwestern and northeastern portions of the area serve as holding and set-up areas, while the center portion serves as the engagement area. These missions are flown at altitudes between 5,000 feet AGL to 20,000 feet AGL.

AG

AG missions are conducted in the southern portion of B-20 as depicted in Figure 4-14. The high altitude missions are flown between 7,000 feet AGL and 15,000 feet AGL, while the low altitude missions are flown between 500 feet AGL and 3,000 feet AGL.

Conventional and Strafe Patterns

The Conventional and Strafe Pattern in Bravo 20 includes two racetrack patterns as depicted in Figure 4-14 – a South Strafe pattern and the South Bull pattern. All the tracks have a west run-in. The northern strafe target and the northern and central Bull are not used frequently so they are not the modeled. typical profile for these pattern begins on the back side of the race track at an altitude between 3,000 feet AGL and 8,000 feet AGL, then proceed to the target to the "bottom-out" altitude during the dive of 1000 feet AGL (near the target), followed by the climb to the back side of the race track at an altitude of between 3,000 feet AGL and 8,000 feet AGL.

4.6.2 Modeled Support Flight Areas and Operations

F-5 aircraft fly BFM, Adversary Support, Familiarization (FAM) and Post Maintenance Check Flights (PMCF) missions in and around Bravo 20. Table 4-13b provides a description of each mission and the applicable modeling parameters such as time, number of passes per mission, average power settings, average airspeed and altitude distribution. A total of 94 F-5 busiest month sorties occurred in for Baseline. Figure 4-14 depicts the flight area associated with Bravo 20. None are conducted during the L_{dnmr} nighttime period.

BFM, Adversary, FAM, and PMCF

These missions are all flown generally within the polygon depicted in Figure 4-14. These missions describe all the random operations flown into the Bravo 20 area for the purpose of supporting various range exercises, flight training or range familiarization. Low altitudes are rarely flown during these missions, with the majority of the time being spent above 11,000 feet AGL.

Table 4-13b Baseline Busiest Month Operations at Bravo 20 for F-5

Mission	% of Operations	Time in Area (min)	Reported Avg Power Setting (%RPM)	Reported Avg Airspeed (KIAS)	Reported Average Altitude (AGL)	F-5 Operations		
						Day (0700-2200)	Night (2200-0700)	Total
BFM	25%	30	90%	350	0.5K-11K (5%) 11K-18K (60%) 18K-25K (35%)	23	0	23
Adversary	50%	20	90%	350	5K-14K MSL (9k AGL)	48	0	48
FAM	15%	15 min BFM, 15 min Adv.	90%	350	same as BFM	14	0	14
PMCF	10%	20	80%-Mil	300	5k-25k	9	0	9
Total						94	0	94

4.6.3 Modeled Helicopter Flight Tracks, Areas and Baseline Operations

H-60 missions within Bravo 20 include Defensive Maneuvers (DM) and Anti-surface Warfare (SUW) operations. Table 4-13c provides a description of each area and the applicable modeling parameters such as time, number of passes, average power settings, average airspeed and altitude distribution. A total of 78 H-60 busiest month operations (100 percent during the L_{dnmr} nighttime period) are modeled for Baseline. Figure 4-15 depicts the modeled areas and tracks representing the different missions flown by the H-60 helicopter within Bravo 20.

DM and SUW

DM and SUW missions consist of a group of tracks and areas as depicted in Figure 4-15. The missions conducted in these areas and along the tracks are generally flown between 100 and 300 feet AGL as detailed in Table 4-13c..

Table 4-13c Baseline Busiest Month Operations at Bravo 20 for H-60

Mission	Mission Percentages	Event Description	% of Operations	Number of Runs per Sortie	Time in Area (min)	Average Airspeed (KIAS)	Average Altitude (AGL)	H-60 Operations		
								Day (0700-2200)	Night (2200-0700)	Total
Defensive Maneuvers (DM)	50%	West Maneuver Area	30%		18	70-120	100-300	3	0	3
		East Maneuver Area	70%		18	70-120	100-300	7	0	7
		Holding Area	100%		36	0	100-300	11	0	11
		Ingress to Maneuver Area	100%	1		70-120	100-300	11	0	11
		Submarine Area	70%		36	70-120	100-300	7	0	7
Anti-Surface Warfare (SUW)	50%	West Maneuver Area	30%		18	80-100	300	3	0	3
		East Maneuver Area	70%		18	80-100	300	7	0	7
		Holding Area	100%		36	0	300	11	0	11
		Ingress to Maneuver Area	100%	1		80-100	300	11	0	11
		Submarine Area	70%		36	80-100	300	7	0	7
Total								78	0	78

4.6.4 Baseline Noise Exposure

Using the data described in Sections 4.6.1 through 4.6.3, MR_NMAP was used to calculate the 60 dB through 85 dB L_{dnmr} contours, in 5 dB increments, for the Baseline Bravo 20 events. The resulting L_{dnmr} contours for all FRTC aircraft operations combined are plotted in Figure 4-16 and zoomed to the Bravo 20 area. The 60 dB and 65 dB L_{dnmr} would extend up to 12,000 feet and 16,000 feet beyond the Bravo 20 range boundary, respectively, but would not affect any populated areas. This L_{dnmr} contours are caused by the F/A-18 and F-16 AG missions at low altitudes of 500 to 3,000 feet AGL. The conventional bombing patterns to the southern bullseye cause a 75 dB L_{dnmr} contour less than 5,000 feet in length in the vicinity of the target.

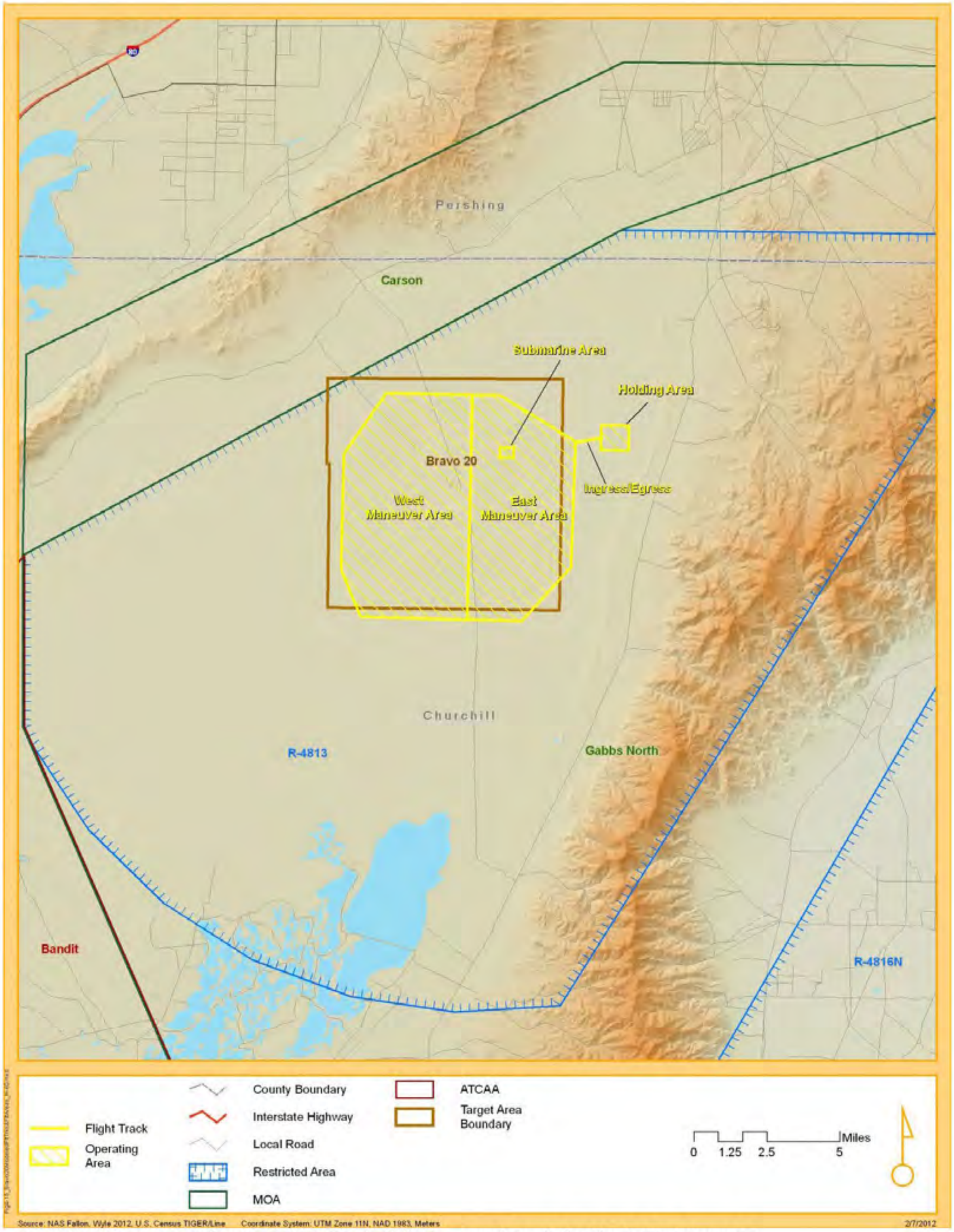

Figure 4-15 Modeled Flight Areas and Tracks for the H-60 at Bravo 20

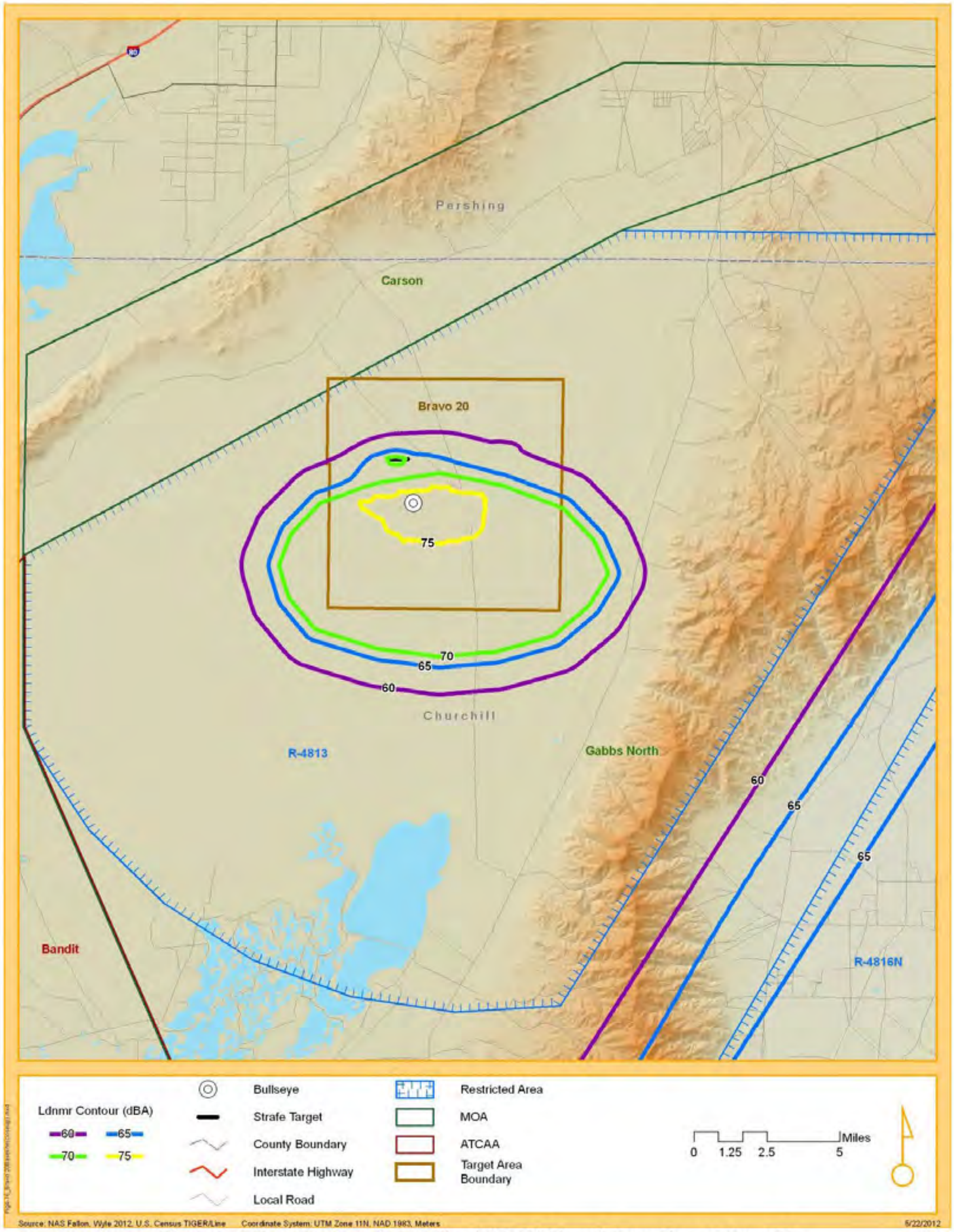

Figure 4-16 L_{dnmr} Contours for Baseline (FY2010) Aircraft Operations at Bravo 20

4.6.5 Prospective Operations

The Prospective scenario for B-20 could include the same FRTC-wide changes discussed in Section 4.1.3. The F/A-18C/D and F/A-18E/F would remain the top users with 33 and 40 percent of all B-20 operations, respectively. The Prospective modeled busiest month training operations would total 2,942 as shown in Table 4-14a.

Table 4-14a Prospective Busiest Month Operations at Bravo 20 for F-18C/D, F-18E/F, and F-16

Mission	Description	F/A-18C/D			F/A-18E/F			F-16			Total
		Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	
		Area Operations									
BFM	Setup and Engagement Area	57	1	58	70	1	71	19	-	19	**148**
Air-to-Ground	Area A - FRS	229	2	231	279	3	282	74	1	75	**588**
		Passes									
Conventional / Strafe Pattern	South Strafe (50%)	429	4	433	523	6	529	139	2	141	**1,103**
	South Conventional (50%)	429	4	433	523	6	529	139	2	141	**1,103**
Total		1,144	11	1,155	1,395	16	1,411	371	5	376	2,942

As shown in Tables 4-14b and 4-14c, the F-5 and H-60 operations would increase by 10 percent relative to Baseline to a total of 103 and 86 operations, respectively.

There would not be any changes to the flight tracks or the flight profiles in B-20 for FY2015.

Table 4-14b Prospective Busiest Month Operations at Bravo 20 for F-5

Mission	F-5 Operations		
	Day (0700-2200)	Night (2200-0700)	Total
BFM	25	0	25
Adversary	53	0	53
RAM	15	0	15
PMCF	10	0	10
Total	103	0	103

Table 4-14c Prospective Busiest Month Operations at Bravo 20 for H-60

Mission	Event Description	H-60 Operations		
		Day (0700-2200)	Night (2200-0700)	Total
Defensive Maneuvers (DM)	West Maneuver Area	3	0	3
	East Maneuver Area	8	0	8
	Holding Area	12	0	12
	Ingress to Maneuver Area	12	0	12
	Submarine Area	8	0	8
Anti-Surface Warfare (SUW)	West Maneuver Area	3	0	3
	East Maneuver Area	8	0	8
	Holding Area	12	0	12
	Ingress to Maneuver Area	12	0	12
	Submarine Area	8	0	8
Total		86	0	86

4.6.6 Prospective Noise Exposure

The Prospective noise contours for the all FRTC aircraft operations combined are plotted in Figure 4-17 which is zoomed to the Bravo 20 range area. The 60 dB and 65 dB L_{dnmr} contours would be very similar to Baseline in terms of size and shape. L_{dnmr} would increase less than 1 dB. The primary cause of the small increase would be the overall increase in operations of 10 percent across the entire FRTC. The secondary cause of the increase in L_{dnmr} would be the transition from F/A-18C/D to the F/A-18E/F.

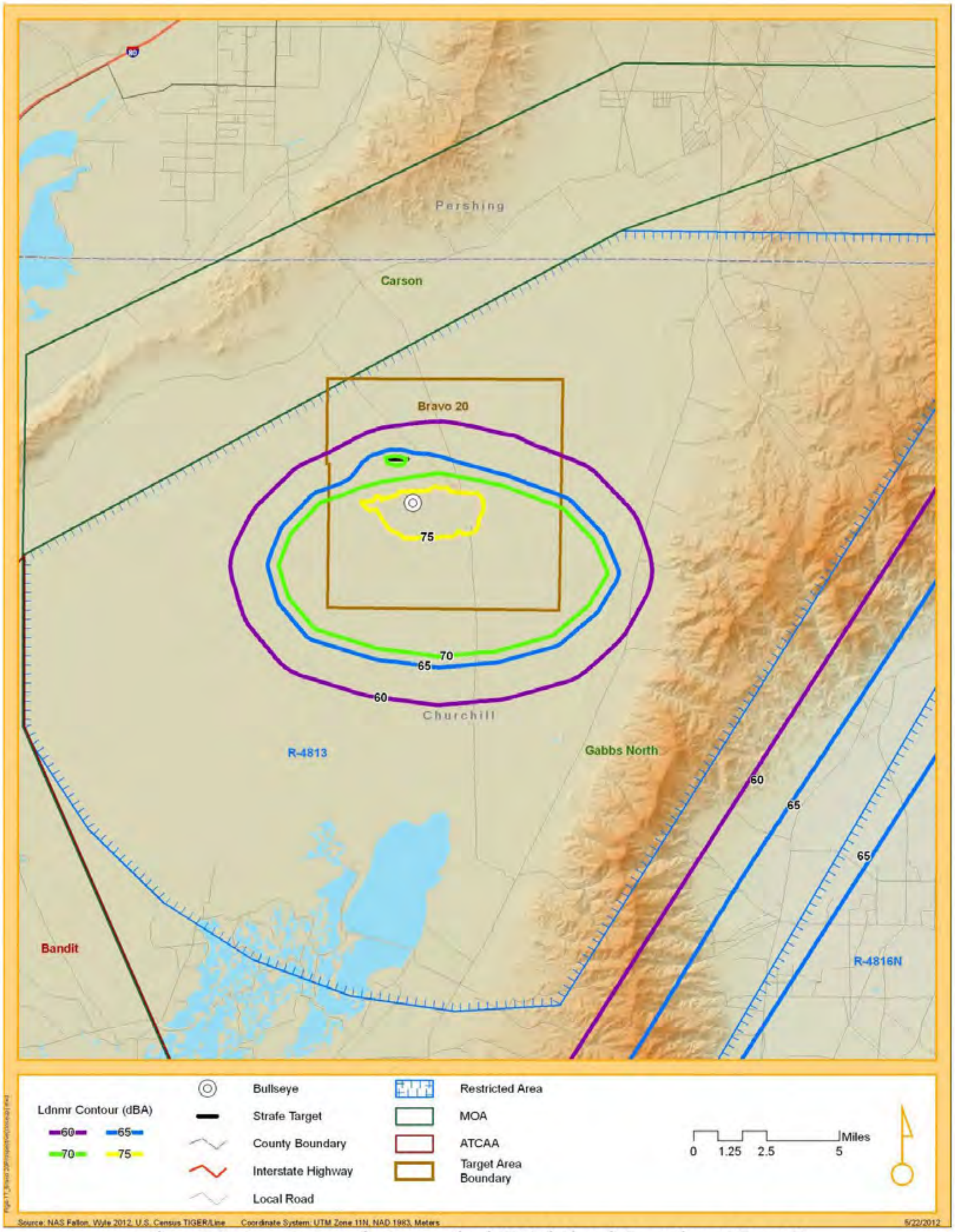

Figure 4-17 L_{dnmr} Contours for Prospective (FY2015) Aircraft Operations at Bravo 20

4.7 Adversary Combat Training

The FRTC is the focal point for all Navy, and some Marine, graduate level aviation strike warfare training. This training is under the cognizance of NSAWC, which develops realistic combat training scenarios for military aircrew flying high performance jet aircraft and helicopters, employing state of the art military equipment and tactics. NSAWC includes the Naval Strike Warfare Center (STRIKE U), Navy Fighter Weapons School (TOPGUN) and the Carrier Airborne Early Warning Weapons School (TOPDOME).

Analysis of aircraft operations in the previous sections focused on activity in and around the Bravo training ranges which commonly utilized ground targets. A significant portion range operations do not focus on the Bravo ranges but instead utilize much larger portions of FRTC. This includes the utilization of multiple contiguous areas as single flight areas. Based upon information provided by NSAWC personnel it was determined that a typical busiest month for these large area operations would include the first 3 weeks of TOPGUN and 4 weeks of Carrier Air Wing (CVW) training.

Sections 4.7.1, 4.7.2 and 4.7.3 present the modeled operations, modeled areas, and flight profiles and resultant noise exposure for the Baseline condition. Sections 4.7.4 and 4.7.5 present the operations and resultant noise exposure for the Prospective scenario, respectively.

4.7.1 Modeled Baseline Operations

TOPGUN student training occurs over a 6-week period and includes both classroom and air-to-air combat simulation training. Table 4-15 lists the TOPGUN training exercises each week with an estimated total of 540 busiest month sorties for Weeks 1 through 3. Week 1 is focused on classroom training for students while the instructors conduct simulated combat for teacher training and proficiency. Week 2 focuses on student training in aircraft and Week 3 includes additional teacher training. Week 4 includes air-to-ground (AG) training which occurs at Bravo 17 and was assumed to have been captured in Section 4.4 AG events modeling. Weeks 5 and 6 include slightly different missions but would result in similar numbers of sorties and fall outside of the definition of busiest month and so are not modeled. Modeled busiest month sorties for TOPGUN total 540.

The CVW training occurs over a 4-week period specific training exercises listed in Table 4-16. Week 1 consists of air-to-air simulated combat very similar to the TOPGUN training. Weeks 2 and 4 include Large Force Exercises (LFE) which focuses on the same adversary combat training but with a different mix of aircraft. For the purposes of this analysis it is assumed that the LFEs utilize similar flight areas as TOPGUN. The remaining CVW training exercises are captured in Sections 4.3 through 4.6 and are not addressed in this section. Modeled busiest month sorties for CVW adversary training total 724.

Consistent with previous sections the adversary F/A-18 sorties were modeled as 55 and 45 percent F/A-18C/D and F/A-18E/F, respectively. The CVW EA-6B/18G sorties were modeled as 72 and 25 percent EA-6B and EA-18G, respectively.

Table 4-15 TOPGUN Training Exercises

Week	Training Description	Aircraft Flown	Aircraft per Event	Events per Day	Days per Week	F/A-18	F-5	Total Weekly Sorties
1	Academics and IUT (teacher training)	F-18 x 6, F-5 x 6	12	3	5	90	90	180
2	BFM Detachment	F-18 x 6, F-5 x 6	12	3	5	90	90	180
3	Academics and IUT (teacher training)	F-18 x 6, F-5 x 6	12	3	5	90	90	180
4	Air-to-Ground (1)							
5 (2)	Section 2 vs Many (NSAWC 1&2)							
6 (2)	4 vs Many (All airspace)							
Modled						270	270	540
Not Modeled						0	0	0
Total						270	270	540

Notes:

(1) Air-to-Ground operations would occur to target in B-17; See section 4.4 for B-17 modeling

(2) Shaded cell not included in modeling since events occur in a different month

Table 4-16 Carrier Air Wing Training Exercises

Week	Training Description	Aircraft Flown	Aircraft per Event	Events Week	F/A-18	F-5	EA-6B/ EA-18G	C-2	UH-60	Total Weekly Sorties
1	UCT NSAWC 1&2	F-18 x 6; F-5 x 6	12	15	90	90	-	-	-	180
2	9 X LFE (22 vs 12)	F-18 x 18; EA6 or 18G x 2; C-2 x 2; F-5 x 12	34	9	162	108	18	18	-	306
	6 X CSAR / SOFE (1)	F-18 x 8; C-2 x 1; EA6 or 18G X 10; UH-60 x 3,	22	6	48	-	60	6	18	132
	6 X CAS (1)	F-18 x 16; UH-60 x 2	18	6	96	-	-	-	12	108
3	CAS (1)	F-18 x 16; UH-60 x 2	18	1	16	-	-	-	2	18
	6 X Dynamic targeting (1)	F-18 x 18; EA6 or 18G x 20; C-2 x 2; UH-60 x 2	42	6	108	-	120	12	12	252
4	8 X LFE	F-18 x 18; EA6 or 18G x 2; C-2 x 2; F-5 x 12	34	8	144	96	16	16	-	272
	8 X Dynamic targeting (1)	F-18 x 18; EA6 or 18G x 20; C-2 x 2; UH-60 x 2	42	8	144	-	160	16	16	336
Modeled					396	294	34	-	-	724
Not Modeled					412	-	340	68	60	880
Total					808	294	374	68	60	1,604

Notes:

(1) Shaded cells not modeled as Adversary Exercises' because these events were modeled with the Bravo ranges except C-2 events which were not modeled due to minimal contribution to overall noise environment

4.7.2 Modeled Areas and Flight Profiles

The TOPGUN and CVW training often utilizes large portions of FRTC which extend beyond individual MOAs. Figure 4-17 depicts the typical flight areas during a TOPGUN training event. The TOPGUN students, flying F/A-18 aircraft, will setup in the Staging area in the east. The instructors operate F-5 aircraft to represent enemy aircraft, referred to as "bandits", and setup in the Bandit area. Once all aircraft are in the proper initial locations the simulated combat begins with air-to-air combat in the engagement area. As the simulated combat begins to conclude aircraft typically conclude in the Ending area represented on Figure 4-18. The CVW air-to-air combat training is conducted in a similar manner with students initiating in the east while instructors operating F-5 aircraft begin in the west.

Aircraft fly at varying speeds and altitudes during these combat training exercises. For the purposes of modeling these events the average power settings, averages speeds, and typical altitudes were used as listed in Table 4-17. Aircraft typically begin at higher altitudes and lower power settings. As the combat simulation begins average aircraft power settings increase. As aircraft engagement continues aircraft typically "fight" their way down in altitude. When aircraft near the end of the simulation and the Ending area aircraft speeds and power settings are the highest and altitude is lowest.

Table 4-17 TOPGUN and CVW Flight Profile and Distribution Among Modeled Flight Areas

Altitude Bands		Avg Speed (KIAS)	Avg Power (%NC or %RPM)	Flight Areas		
				Initiation (1)	Engagement	End
Hi	30k-50k	350	80% NC	30%	23%	16%
Med	15k-30k	350	90% NC	30%	24%	17%
Low	3k(AGL)-15k(MSL)	350	90% NC	30%	24%	17%
Low Low	500-3k(AGL)	450	MIL	10%	29%	50%
Minutes in area(2)				20	90	10

Notes:
(1) F-5s start in bandit area and other aircraft start in Staging area
(2) Engagement duration consists of three 30 minute engagement exercises

4.7.3 Baseline Noise Exposure

Using the data described in Sections 4.7.1 and 4.7.2, MR_NMAP was used to calculate the 60 dB through 85 dB L_{dnmr} contours, in 5 dB increments, for the Baseline adversary events. The resulting L_{dnmr} contours for all FRTC aircraft operations are plotted in Figure 4-1. The adversary events contribute to generation of the 60 dB L_{dnmr} contour along the modeled Staging area and the Ending area. Additionally, the Engagement area has a maximum distributed L_{dnmr} of 58 dB which contributes to the widening of the 60 and 65 dB contours along the fixed-wing ingress/egress routes and increase in contour area at Bravo 17 and Bravo 20.

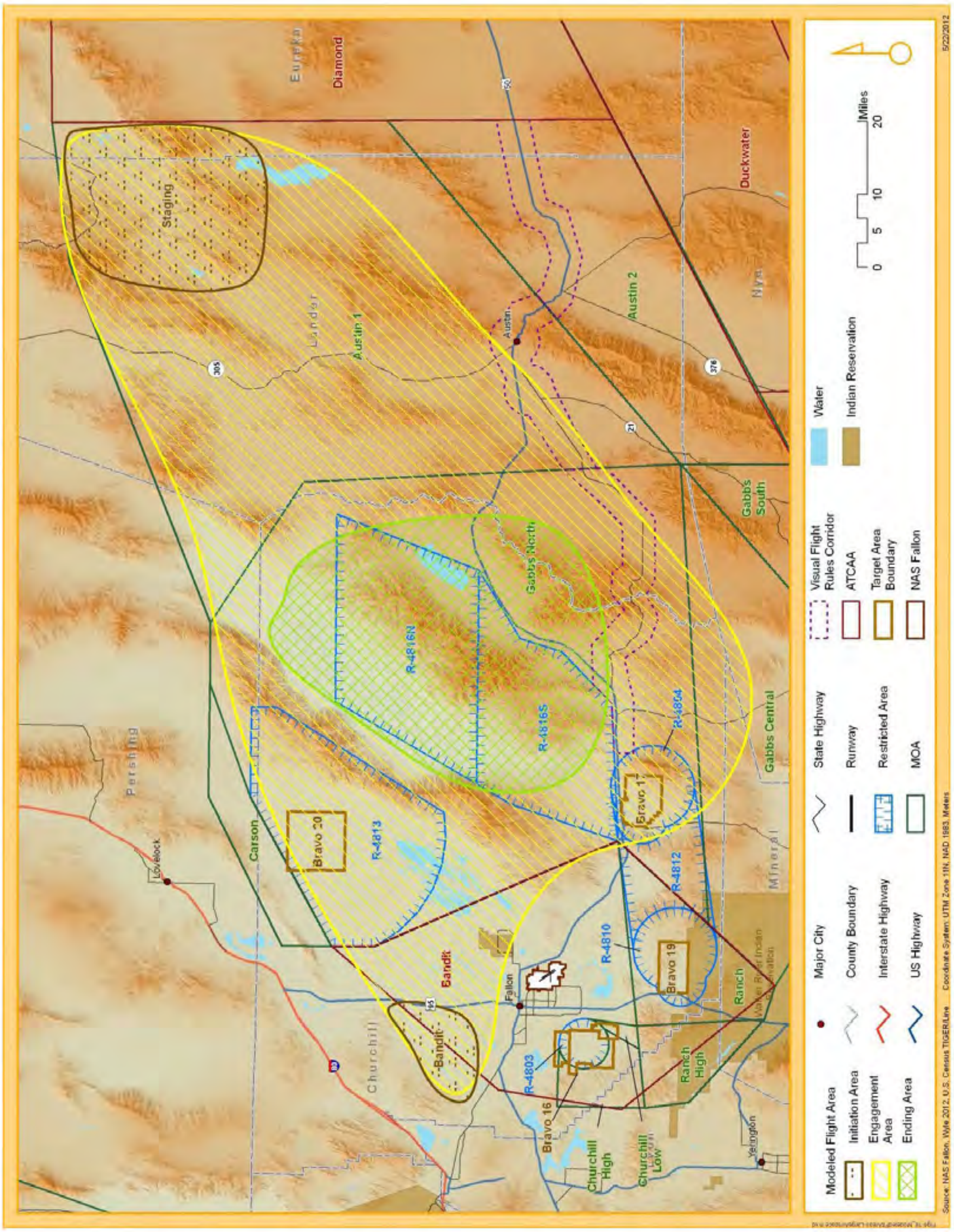

Figure 4-18 Modeled Flight Areas for Adversary Combat Training in Large Airspace

4.7.4 Prospective Sorties

Baseline sorties modeled for both TOPGUN and CVW were based on the busiest month of events that could occur in a four week period. The FRTC is expected to be supporting 10 percent more overall operations in FY2015. More TOPGUN and CVW training courses could occur during the Prospective year but it is anticipated that Prospective sorties totals for a busiest month would not change from the Baseline 540 and 724 for TOPGUN and CVW, respectively. The overall transition from the F/A-18C/D to F/A-18E/F aircraft and EA-6B to EA-18G aircraft occurring Navy-wide is assumed to also apply to the TOPGUN and Carrier Air Wing sorties. Modeling was adjusted to the FY2015 ratios.

4.7.5 Prospective Noise Exposure

Using the data described in Sections 4.7.4, MR_NMAP was used to calculate the 60 dB through 85 dB L_{dnmr} contours, in 5 dB increments, for the Prospective adversary events. The resulting L_{dnmr} contours for all FRTC aircraft operations are plotted in Figure 4-2. Similar to Baseline, the Prospective adversary events would contribute to generation of the 60 dB L_{dnmr} contour along the modeled Staging area and the Ending area. Additionally, the Engagement area would have a maximum distributed L_{dnmr} of 58 dB which would contribute to the widening of the 60 and 65 dB contours along the fixed-wing ingress/egress routes and increase in contour area at Bravo 17 and Bravo 20. Relative to Baseline, the change in L_{dnmr} would be less than 0.5 dB.

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SECTION 5

Supersonic Aircraft Operations

5.1 Supersonic Activities

The FRTC offers a unique environment for combat training not available elsewhere. In addition to the ranges discussed in the previous section, the FRTC includes a Supersonic Operating Area (SOA) to support high speed training activities and maneuvers in excess of Mach 1. The SOA is located at the northern portions of Gabbs North and Austin 1 MOAs as shown in Figure 3-2 with a minimum altitude of 11,000 ft MSL for supersonic flight.

5.1.1 Baseline Supersonic Operations and Modeled Area

Most supersonic flights occur during adversarial training simulating air-to-air combat situations. Typical adversarial exercises are the TOPGUN and CVW LFE discussed in Section 4.7. It is common for most aircraft capable of supersonic flight to spend a portion of adversarial sorties at speeds greater than Mach 1. The busiest month supersonic sorties were determined by combining Gabbs North and Austin 1 MOA sorties tabulated by CSC Norco (Weisenberger 2011) for supersonic capable aircraft. For this analysis it was assumed that all of the tabulated F/A-18C/D, F/A-18E/F, F-16, and F-22 sorties in Gabbs North and Austin 1 exceed Mach 1 while operating within SOA for at least a portion of the sortie duration. The F-5 is unique and does not always exceed Mach 1 during adversarial support training. Based upon F-5 squadron input, approximately five percent of the 1,572 FY2010 adversarial sorties would exceed Mach 1. This results in an estimated 458 supersonic events for all aircraft during the busiest month as listed in Table 5-1. The F/A-18C/D and F/A-18E/F generated the majority of these sorties with 48 and 40 percent, respectively. Consistent with the TOPGUN and CVW adversarial sorties, 15 percent of supersonic sorties are modeled during L_{Cdn} nighttime. For noise analysis purposes, one L_{Cdn} nighttime event is equivalent to 10 L_{Cdn} daytime events. The BooMap96 model does not support L_{Cdn} nighttime event input so these events were converted to the equivalent number of L_{Cdn} daytime events by multiplying by a factor of 10.

The BooMap96 model utilizes elliptical flight areas for computation. The shape of the SOA necessitated the use of two similarly-sized elliptical modeled flight areas to represent the supersonic flight activity. The Gabbs North and Austin 1 sorties totals were modeled in the western ellipse and eastern ellipse, respectively. The modeled ellipses are depicted in the Appendix.

Table 5-1 Baseline Busiest Month Supersonic Sorties

Aircraft	Gabbs North				Austin 1				SOA Grand Totals	
	Day (0700-2200)	Night (2200-0700)	Total	Equivalent Daytime Events	Day (0700-2200)	Night (2200-0700)	Total	Equivalent Daytime Events	Events	Equivalent Daytime Events
F/A-18C/D	85	15	100	235	103	18	122	283	222	518
F/A-18E/F	70	12	82	190	86	15	101	236	183	426
F-16	14	3	17	44	17	3	20	47	37	91
F-22	3	-	3	3	3	-	3	3	6	6
F-5 (1)	4	1	4	14	5	1	6	15	10	29
Grand Total	176	31	206	486	214	37	252	584	458	1,070

Notes: (1) F-5 annual supersonic events provided by squadrons.
(2) 1,572 annual Adversary support sorties.
(3) 5% of adversary sorties are supersonic

5.1.2 Baseline Noise Exposure

Using the data described in Section 5.1.1, BooMap96 was used to calculate the 57 dB through 85 dB L_{Cdn} contours, in 5 dB increments, for the Baseline aircraft supersonic operations. The resulting L_{Cdn} contours do not reach or exceed 57 dB due to insufficient activity for the size of the flight area. The maximum L_{Cdn} of 52 dB occurs near the center of SOA.

5.1.3 Prospective Supersonic Operations

Consistent with changes to aircraft replacement across the Navy and over the entire FRTC, supersonic sorties are expected to experience a similar transition from the F/A-18C/D to the F/A-18E/F for the Prospective FY2015 as well as an increase in operations of 10 percent relative to Baseline. Table 5-2 shows the 503 estimated supersonic busiest month sorties for the Prospective scenario. The F/A-18C/D and F/A-18E/F would remain the top generators of supersonic flight at the FRTC with 40 and 49 percent, respectively.

Table 5-2 Prospective Busiest Month Supersonic Sorties

Aircraft	Gabbs North				Austin 1				SOA Grand Totals	
	Day (0700-2200)	Night (2200-0700)	Total	Equivalent Daytime Events	Day (0700-2200)	Night (2200-0700)	Total	Equivalent Daytime Events	Events	Equivalent Daytime Events
F/A-18C/D	94	17	110	264	113	20	134	313	244	577
F/A-18E/F	77	13	90	207	95	17	111	265	201	472
F-16	15	3	19	45	19	3	22	49	41	94
F-22	3	-	3	3	3	-	3	3	6	6
F-5 (1)	4	1	4	14	6	1	7	16	11	30
Grand Total	193	34	226	533	236	41	277	646	503	1,179

Notes:
(1) assumed 10 percent increase in Adversary support sorties for FY2015 relative to Baseline.
(2) 5% of adversary sorties are supersonic

5.1.4 Prospective Noise Exposure

Using the data described in Sections 5.1.1 and 5.1.3, BooMap96 was used to calculate the 57 dB through 85 dB L_{Cdn} contours, in 5 dB increments, for the Prospective aircraft supersonic operations. The resulting L_{Cdn} contours would not reach or exceed 57 dB due to insufficient activity for the size of the flight area. The maximum L_{Cdn} of 53 dB would occur near the center of SOA. The L_{Cdn} due to Prospective supersonic operations would increase approximately 1 dB relative to Baseline.

SECTION 6 Noise Exposure Due to Large Caliber Weapons

For this analysis weapon projectiles with diameters greater than 20mm are considered large caliber weapons. The modeling information for Bravo 17, Bravo 19 and Bravo 20 in WR 06-07 was reviewed by FRTC personnel to determine if any updates or changes were necessary to reflect current (FY2010) operations. Sections 6.1 through 6.3 discuss Baseline ordnance modeling and resultant noise exposure. Section 6.4 presents the noise exposure for the Prospective (FY2015) scenario.

6.1 Baseline Ordnance Expenditures

Recent ordnance expenditure events are tracked and were provided by NSAWC for FY 2010 (Weisenberger 2010). Table 6-1 compares the FY2010 events with the WR 06-07 modeling. The small arms and rockets firing events were not part of the WR 06-07 analysis nor the inert ordnance. Total live ordnance events of 2,757 occurred in FY2010 while WR 06-07 had modeled 3,352. The previous modeling included approximately 21 percent more events with a similar distribution among the Bravo ranges.

Table 6-1 Baseline (FY2010) Ordnance Events Comparison

Weapon Type	Ordnance Name	Modeled As	B-16 FY 2010 Reported	B-16 Modeled	B-17 FY 2010 Reported	B-17 Modeled	B-19 FY 2010 Reported	B-19 Modeled	B-20 FY 2010 Reported	B-20 Modeled	Totals FY 2010 Reported	Totals Modeled
Small Arms	5.56 MM	Not Modeled					231,161				231,161	
	7.62 MM		110,968		15,350		97,892		6,850		231,060	
	9 MM						55,057				55,057	
	Shotgun						2,716		1,200		3,916	
	.50 caliber		64,779		14,400		149,638		8,025		236,842	
	40 MM (Gun)		9,201				6,618				15,819	
Rockets	105 MM	Not Modeled			702		316				1,018	
	2.75" (70mm) Inert		85		128		24				237	
	2.75" WP (Phosphorous)				134						134	
Inert Ordnance	BDU-45	Not Modeled			363		171		69		603	
	BDU-50				3						3	
	BLU-110				35						35	
	MK-76		2,324		6,170		3,032		1,139		12,665	
	MK-77				-				3		3	
	Mk-81				4						4	
	Mk-82				134		7		158		299	
	Mk-83				270		31		77		378	
	Mk-84				42		2		5		49	
	GBU-31				40				2		42	
	GBU-51								2		2	
	Hand Grenade		150								150	
	LGTR				1,706		229		465		2,400	
Live Ordnance	GBU-12, 13, and Mk-82	Mk-82			550	948	118	324	101	288	769	1,560
	GBU-16, 32, and Mk-83	Mk-83			515	938	146	302	133	232	794	1,472
	GBU-10, BLU-111, Mk-84	Mk-84			482	-	350	26	316	278	1,148	304
	AGM-114	AGM-114			37	-	-	-	9	16	46	16
Total Live Ordnance			-	-	1,584	1,886	614	652	559	614	2,757	3,352

6.2 Target Areas and Modeled Target Locations

The modeling of target locations in the WR 06-07 were reviewed by NSAWC personnel during the site visit in December 2010 and confirmed as accurate and current.

6.3 Baseline Ordnance Noise Exposure for Bravo 17, Bravo 19 and Bravo 20

Based upon the comparison of FY2010 ordnance events and the WR 06-07 modeled events and no changes to target locations it was determined unnecessary to update the ordnance modeling. The WR 06-07 results are slightly conservative relative to the FY2010 Baseline conditions. The WR 06-07 noise contour figures are reproduced in this study as a conservative estimate of the current Baseline exposure. Figure 6-1 through Figure 6-3 depicts the 57, 62 and 70 dB L_{Cdn} contours for Bravo 17, Bravo 19 and Bravo 20. Refer to WR 06-07 for further details.

6.4 Prospective Ordnance Expenditures

Based upon the comparison of FY2010 ordnance events and the WR 06-07 modeled events and no changes to target locations it was determined unnecessary to update the ordnance modeling. The WR 06-07 results are slightly conservative relative to the FY2010 Baseline conditions. The WR 06-07 noise contour figures are reproduced in this study and are considered the current Baseline exposure. Figures 6-1 through 6-3 depict the 57, 62 and 70 dB L_{Cdn} contours for Bravo 17, Bravo 19 and Bravo 20. WR 06-07 had determined that the detonation of HE material in air-to-ground applications (e.g., a MK-82 bomb) on flat terrain resulting in near-circular contours centered on the target as seen around Bravo 20 in Figure 5-3. Although the 57 dBC DNL contours would extend up 3 miles beyond the range boundary at Bravo 17 ,19, and 20, it would not affect any populated area because none existing in the vicinity. Refer to WR 06-07 for further details.

Table 6-2 Prospective Ordnance Events Comparison

Weapon Type	Ordnance Name	Modeled As	B-17		B-19		B-20		Totals	
			CY 2015 Estimated	Modeled	CY 2015 Estimated	Modeled	CY 2015 Estimated	Modeled	CY 2015 Estimated	Modeled
Live Ordnance	GBU-12, 13, and Mk-82	Mk-82	605	948	130	324	111	288	846	1,560
	GBU-16, 32, and Mk-83	Mk-83	567	938	161	302	146	232	874	1,472
	GBU-10, BLU-111, Mk-84	Mk-84	530	-	385	26	348	278	1,263	304
	AGM-114	AGM-114	41	-	-	-	10	16	51	16
Total Live Ordnance			1,743	1,886	676	652	615	814	3,034	3,352

Note: No live ordnance at B-16

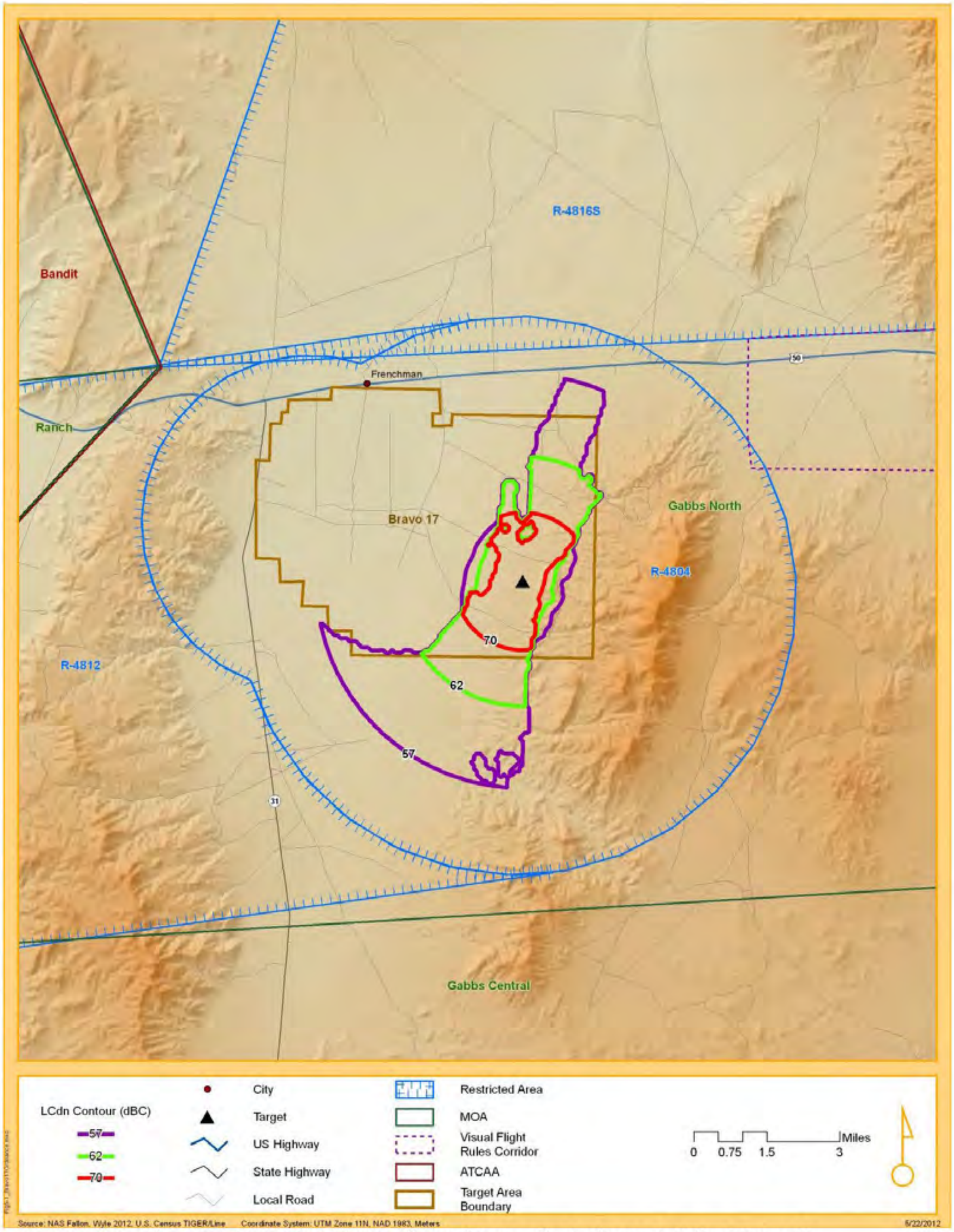

Figure 6-1 L_{Cdn} Contours for Baseline and Prospective Ordnance Activity at Bravo 17

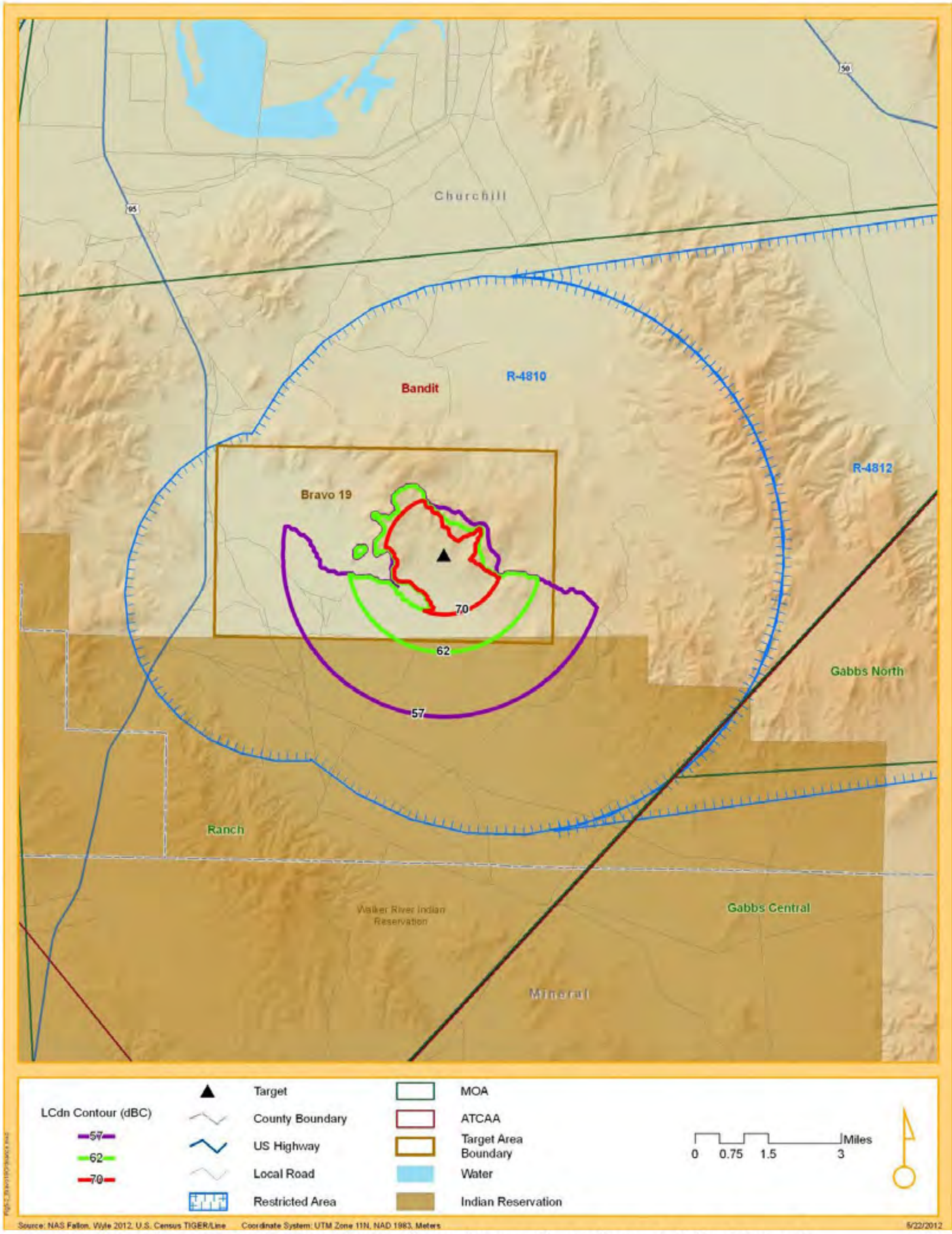

Figure 6-2 L_{Cdn} Contours for Baseline and Prospective Ordnance Activity at Bravo 19

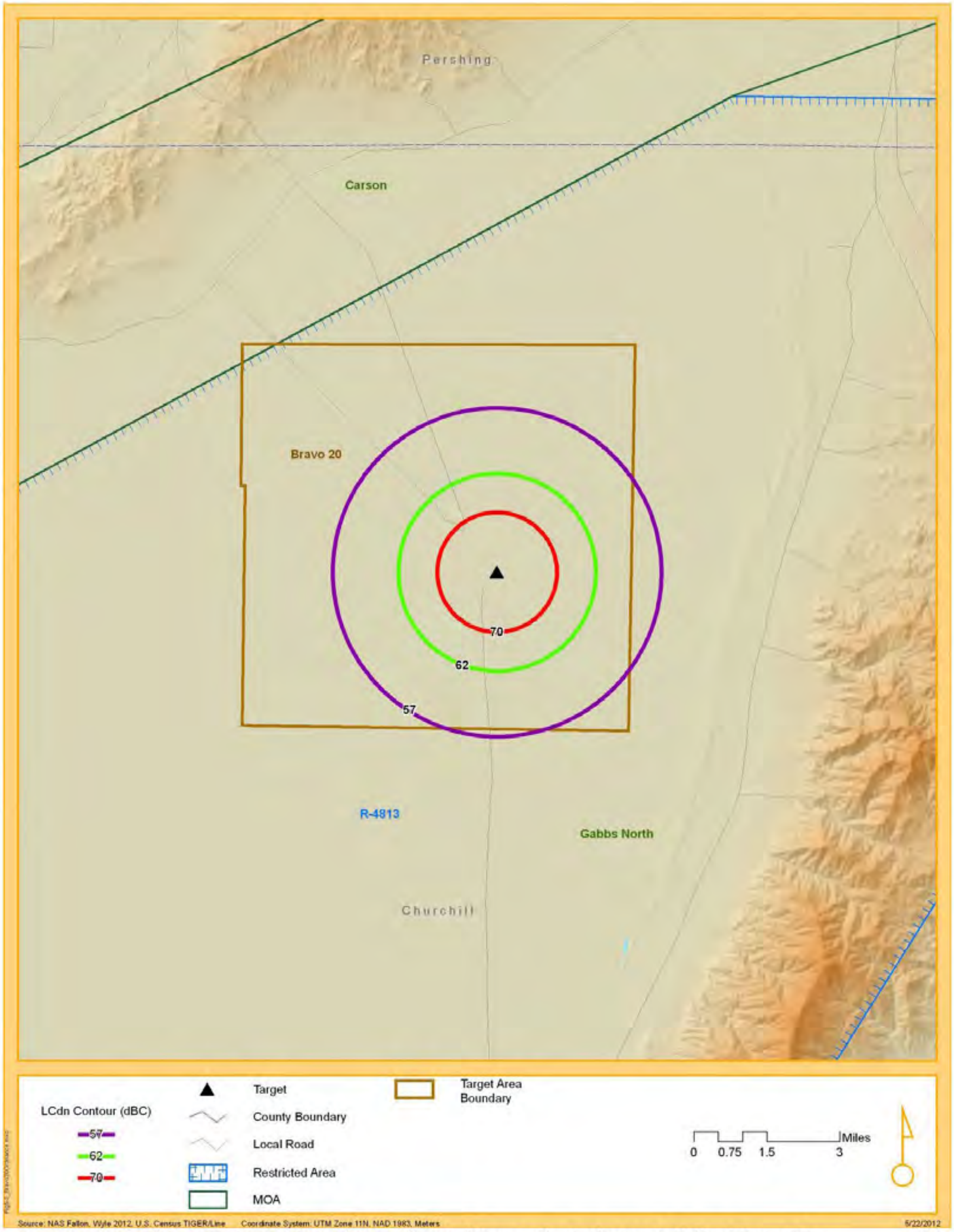

Figure 6-3 L_{Cdn} Contours for Baseline and Prospective Ordnance Activity at Bravo 20

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Appendix A

SUPPORTIVE TABULAR AND GRAPHIC DATA

Table A-1 Ingress and Egress Modeled Profiles and Operations for Baseline (CY2010)

Airspace ID	Mission ID	Aircraft ID	Speed (KIAS)	Power Description	Power Setting	Units	Period of Day	Busy month Ops	Altitude Range (ft)					
									100 300	500 1000	5600 6600	4k 10k	4k 11k	4k 14k
STILIN	F18_IN	F-18	350	TAKEOFF POWER	96.50%	NC	daytime	701				100		
STILIN	F18_IN	F-18	350	TAKEOFF POWER	96.50%	NC	nighttime	7				100		
STILIN	F18E_IN	F-18E/F	350	TAKEOFF POWER	96.00%	N2	daytime	629				100		
STILIN	F18E_IN	F-18E/F	350	TAKEOFF POWER	96.00%	N2	nighttime	6				100		
STILIN	F16_IN	F-16(G100)	350	TAKEOFF POWER	104.00%	NC	daytime	97				100		
STILIN	F16_IN	F-16(G100)	350	TAKEOFF POWER	104.00%	NC	nighttime	1				100		
STILIN	F5_IN2	F-5E	300	TAKEOFF POWER	101.00%	RPM	daytime	87					100	
STILIN	F5_IN2	F-5E	300	TAKEOFF POWER	101.00%	RPM	nighttime	1					100	
SHOIN	F18_IN	F-18	350	TAKEOFF POWER	96.50%	NC	daytime	1,635				100		
SHOIN	F18_IN	F-18	350	TAKEOFF POWER	96.50%	NC	nighttime	17				100		
SHOIN	F18E_IN	F-18E/F	350	TAKEOFF POWER	96.00%	N2	daytime	1,467				100		
SHOIN	F18E_IN	F-18E/F	350	TAKEOFF POWER	96.00%	N2	nighttime	15				100		
SHOIN	F16_IN	F-16(G100)	350	TAKEOFF POWER	104.00%	NC	daytime	227				100		
SHOIN	F16_IN	F-16(G100)	350	TAKEOFF POWER	104.00%	NC	nighttime	2				100		
SHOIN	F5_IN1	F-5E	350	TAKEOFF POWER	101.00%	RPM	daytime	131					100	
SHOIN	F5_IN1	F-5E	350	TAKEOFF POWER	101.00%	RPM	nighttime	1					100	
STILEG	F18_EG1	F-18	300	CRUISE POWER	85.00%	NC	daytime	771				100		
STILEG	F18_EG1	F-18	300	CRUISE POWER	85.00%	NC	nighttime	8				100		
STILEG	F18_EG2	F-18	300	CRUISE POWER	85.00%	NC	daytime	514		100				
STILEG	F18_EG2	F-18	300	CRUISE POWER	85.00%	NC	nighttime	5		100				
STILEG	F18E_EG1	F-18E/F	300	CRUISE POWER	85.00%	N2	daytime	692				100		
STILEG	F18E_EG1	F-18E/F	300	CRUISE POWER	85.00%	N2	nighttime	7				100		
STILEG	F18E_EG2	F-18E/F	300	CRUISE POWER	85.00%	N2	daytime	461		100				
STILEG	F18E_EG2	F-18E/F	300	CRUISE POWER	85.00%	N2	nighttime	5		100				
STILEG	F16_EG1	F-16(G100)	300	MAX ENDURANCE	85.00%	NC	daytime	107				100		
STILEG	F16_EG1	F-16(G100)	300	MAX ENDURANCE	85.00%	NC	nighttime	1				100		
STILEG	F16_EG2	F-16(G100)	300	MAX ENDURANCE	85.00%	NC	daytime	71		100				
STILEG	F16_EG2	F-16(G100)	300	MAX ENDURANCE	85.00%	NC	nighttime	1		100				
STILEG	F5_EG1	F-5E	350	TAKEOFF POWER	95.00%	RPM	daytime	129						100
STILEG	F5_EG1	F-5E	350	TAKEOFF POWER	95.00%	RPM	nighttime	1						100
STILEG	F5_EG2	F-5E	350	TAKEOFF POWER	95.00%	RPM	daytime	86		100				
STILEG	F5_EG2	F-5E	350	TAKEOFF POWER	95.00%	RPM	nighttime	1		100				
SHOEG	F18_EG1	F-18	300	CRUISE POWER	85.00%	NC	daytime	23				100		
SHOEG	F18_EG1	F-18	300	CRUISE POWER	85.00%	NC	nighttime	0				100		
SHOEG	F18E_EG1	F-18E/F	300	CRUISE POWER	85.00%	N2	daytime	21				100		
SHOEG	F18E_EG1	F-18E/F	300	CRUISE POWER	85.00%	N2	nighttime	0				100		
SHOEG	F16_EG1	F-16(G100)	300	MAX ENDURANCE	85.00%	NC	daytime	3				100		
MIDEG	F18_EG1	F-18	300	CRUISE POWER	85.00%	NC	daytime	187				100		
MIDEG	F18_EG1	F-18	300	CRUISE POWER	85.00%	NC	nighttime	2				100		
MIDEG	F18E_EG1	F-18E/F	300	CRUISE POWER	85.00%	N2	daytime	168				100		
MIDEG	F18E_EG1	F-18E/F	300	CRUISE POWER	85.00%	N2	nighttime	2				100		
MIDEG	F16_EG1	F-16(G100)	300	MAX ENDURANCE	85.00%	NC	daytime	26				100		
MIDEG	F16_EG1	F-16(G100)	300	MAX ENDURANCE	85.00%	NC	nighttime	0				100		
MIDEG	F5_EG1	F-5E	350	TAKEOFF POWER	95.00%	RPM	daytime	2						100
DRAG1	F18_B16	F-18	300	CRUISE POWER	85.00%	NC	daytime	74			100			
DRAG1	F18_B16	F-18	300	CRUISE POWER	85.00%	NC	nighttime	1			100			
DRAG1	F18E_B16	F-18E/F	300	CRUISE POWER	85.00%	N2	daytime	90			100			
DRAG1	F18E_B16	F-18E/F	300	CRUISE POWER	85.00%	N2	nighttime	1			100			
DRAG1	F16_B16	F-16(G100)	300	MAX ENDURANCE	85.00%	NC	daytime	1			100			
DRAG2	F18_B16	F-18	300	CRUISE POWER	85.00%	NC	daytime	74			100			
DRAG2	F18_B16	F-18	300	CRUISE POWER	85.00%	NC	nighttime	1			100			
DRAG2	F18E_B16	F-18E/F	300	CRUISE POWER	85.00%	N2	daytime	90			100			
DRAG2	F18E_B16	F-18E/F	300	CRUISE POWER	85.00%	N2	nighttime	1			100			
DRAG2	F16_B16	F-16(G100)	300	MAX ENDURANCE	85.00%	NC	daytime	1			100			
H_B20	H60_IN	UH60A	110	LFO LOAD 100 KTS	100.0 K	NOTS	daytime	38	100					
H_B17	H60_IN	UH60A	110	LFO LOAD 100 KTS	100.0 K	NOTS	daytime	114	100					
H_B19	H60_IN	UH60A	110	LFO LOAD 100 KTS	100.0 K	NOTS	daytime	38	100					

Table A-2 Ingress and Egress Modeled Profiles and Operations for Prospective (CY2015)

Airspace ID	Mission ID	Aircraft ID	Speed (KIAS)	Power Description	Power Setting	Units	Period of Day	Busy month Ops	Altitude Range (ft) 100-300	500-1000	5600-8600	4k-10k	4k-11k	4k-14k
STILIN	F18_IN	F-18	350	TAKEOFF POWER	96.50%	NC	daytime	658				100		
STILIN	F18_IN	F-18	350	TAKEOFF POWER	96.50%	NC	nighttime	7				100		
STILIN	F18E_IN	F-18E/F	350	TAKEOFF POWER	96.00%	N2	daytime	804				100		
STILIN	F18E_IN	F-18E/F	350	TAKEOFF POWER	96.00%	N2	nighttime	8				100		
STILIN	F16_IN	F-16(G100)	350	TAKEOFF POWER	104.00%	NC	daytime	107				100		
STILIN	F16_IN	F-16(G100)	350	TAKEOFF POWER	104.00%	NC	nighttime	1				100		
STILIN	F5_IN2	F-5E	300	TAKEOFF POWER	101.00%	RPM	daytime	96					100	
STILIN	F5_IN2	F-5E	300	TAKEOFF POWER	101.00%	RPM	nighttime	1					100	
SHOIN	F18_IN	F-18	350	TAKEOFF POWER	96.50%	NC	daytime	1,536				100		
SHOIN	F18_IN	F-18	350	TAKEOFF POWER	96.50%	NC	nighttime	16				100		
SHOIN	F18E_IN	F-18E/F	350	TAKEOFF POWER	96.00%	N2	daytime	1,877				100		
SHOIN	F18E_IN	F-18E/F	350	TAKEOFF POWER	96.00%	N2	nighttime	19				100		
SHOIN	F16_IN	F-16(G100)	350	TAKEOFF POWER	104.00%	NC	daytime	250				100		
SHOIN	F16_IN	F-16(G100)	350	TAKEOFF POWER	104.00%	NC	nighttime	3				100		
SHOIN	F5_IN1	F-5E	350	TAKEOFF POWER	101.00%	RPM	daytime	144					100	
SHOIN	F5_IN1	F-5E	350	TAKEOFF POWER	101.00%	RPM	nighttime	1					100	
STILEG	F18_EG1	F-18	300	CRUISE POWER	85.00%	NC	daytime	724				100		
STILEG	F18_EG1	F-18	300	CRUISE POWER	85.00%	NC	nighttime	7				100		
STILEG	F18_EG2	F-18	300	CRUISE POWER	85.00%	NC	daytime	483		100				
STILEG	F18_EG2	F-18	300	CRUISE POWER	85.00%	NC	nighttime	5		100				
STILEG	F18E_EG1	F-18E/F	300	CRUISE POWER	85.00%	N2	daytime	885				100		
STILEG	F18E_EG1	F-18E/F	300	CRUISE POWER	85.00%	N2	nighttime	9				100		
STILEG	F18E_EG2	F-18E/F	300	CRUISE POWER	85.00%	N2	daytime	590		100				
STILEG	F18E_EG2	F-18E/F	300	CRUISE POWER	85.00%	N2	nighttime	6		100				
STILEG	F16_EG1	F-16(G100)	300	MAX ENDURANCE	85.00%	NC	daytime	118				100		
STILEG	F16_EG1	F-16(G100)	300	MAX ENDURANCE	85.00%	NC	nighttime	1				100		
STILEG	F16_EG2	F-16(G100)	300	MAX ENDURANCE	85.00%	NC	daytime	79		100				
STILEG	F16_EG2	F-16(G100)	300	MAX ENDURANCE	85.00%	NC	nighttime	1		100				
STILEG	F5_EG1	F-5E	350	TAKEOFF POWER	95.00%	RPM	daytime	142						100
STILEG	F5_EG1	F-5E	350	TAKEOFF POWER	95.00%	RPM	nighttime	1						100
STILEG	F5_EG2	F-5E	350	TAKEOFF POWER	95.00%	RPM	daytime	95		100				
STILEG	F5_EG2	F-5E	350	TAKEOFF POWER	95.00%	RPM	nighttime	1		100				
SHOEG	F18_EG1	F-18	300	CRUISE POWER	85.00%	NC	daytime	22				100		
SHOEG	F18_EG1	F-18	300	CRUISE POWER	85.00%	NC	nighttime	0				100		
SHOEG	F18E_EG1	F-18E/F	300	CRUISE POWER	85.00%	N2	daytime	27				100		
SHOEG	F18E_EG1	F-18E/F	300	CRUISE POWER	85.00%	N2	nighttime	0				100		
SHOEG	F16_EG1	F-16(G100)	300	MAX ENDURANCE	85.00%	NC	daytime	4				100		
MIDEG	F18_EG1	F-18	300	CRUISE POWER	85.00%	NC	daytime	176				100		
MIDEG	F18_EG1	F-18	300	CRUISE POWER	85.00%	NC	nighttime	2				100		
MIDEG	F18E_EG1	F-18E/F	300	CRUISE POWER	85.00%	N2	daytime	215				100		
MIDEG	F18E_EG1	F-18E/F	300	CRUISE POWER	85.00%	N2	nighttime	2				100		
MIDEG	F16_EG1	F-16(G100)	300	MAX ENDURANCE	85.00%	NC	daytime	29				100		
MIDEG	F16_EG1	F-16(G100)	300	MAX ENDURANCE	85.00%	NC	nighttime	0				100		
MIDEG	F5_EG1	F-5E	350	TAKEOFF POWER	95.00%	RPM	daytime	2						100
DRAG1	F18_B16	F-18	300	CRUISE POWER	85.00%	NC	daytime	82			100			
DRAG1	F18_B16	F-18	300	CRUISE POWER	85.00%	NC	nighttime	1			100			
DRAG1	F18E_B16	F-18E/F	300	CRUISE POWER	85.00%	N2	daytime	99			100			
DRAG1	F18E_B16	F-18E/F	300	CRUISE POWER	85.00%	N2	nighttime	1			100			
DRAG1	F16_B16	F-16(G100)	300	MAX ENDURANCE	85.00%	NC	daytime	1			100			
DRAG2	F18_B16	F-18	300	CRUISE POWER	85.00%	NC	daytime	82			100			
DRAG2	F18_B16	F-18	300	CRUISE POWER	85.00%	NC	nighttime	1			100			
DRAG2	F18E_B16	F-18E/F	300	CRUISE POWER	85.00%	N2	daytime	99			100			
DRAG2	F18E_B16	F-18E/F	300	CRUISE POWER	85.00%	N2	nighttime	1			100			
DRAG2	F16_B16	F-16(G100)	300	MAX ENDURANCE	85.00%	NC	daytime	1			100			
H_B20	H60_IN	UH60A	110	LFO LOAD 100 KTS	100.0 K	NOTS	daytime	42	100					
H_B17	H60_IN	UH60A	110	LFO LOAD 100 KTS	100.0 K	NOTS	daytime	126	100					
H_B19	H60_IN	UH60A	110	LFO LOAD 100 KTS	100.0 K	NOTS	daytime	42	100					

Table A-3a Bravo-16 Modeled Profiles and Daily Events for Baseline (CY2010)

Aircraft		Track		Profile		Daily Daytime	Daily Nighttime	Total
F-18A/C	45%	HDLD	90%	15FH	61%	7.2986	0.789	2952
				15FL	39%	4.7342	0.3945	1872
		LPLD	5%	LPLD	100%	0.5918	0.1973	288
		LPRD	5%	LPRD	100%	0.5918	0.1973	288
F-18E/F	55%	HDLD	90%	15FH	64%	8.8767	0.9863	3600
				15FL	36%	5.7205	0.5918	2304
		LPLD	5%	LPLD	100%	0.789	0.1973	360
		LPRD	5%	LPRD	100%	0.789	0.1973	360

Table A-3b Bravo-16 Modeled Profiles and Daily Events for Prospective (CY2015)

Aircraft		Track		Profile		Daily Daytime	Daily Nighttime	Total
F-18A/C	45%	HDLD	90%	15FH	61%	8.0234	0.8915	3254
				15FL	39%	5.1058	0.5673	2071
		LPLD	5%	LPLD	100%	0.7294	0.081	296
		LPRD	5%	LPRD	100%	0.7294	0.081	296
F-18E/F	55%	HDLD	90%	15FH	61%	9.8064	1.0896	3977
				15FL	39%	6.2404	0.6934	2531
		LPLD	5%	LPLD	100%	0.8915	0.0991	362
		LPRD	5%	LPRD	100%	0.8915	0.0991	362

Modeled Flight Profiles for Bravo 16

This section provides scaled plots of individual flight profiles for each modeled aircraft type for Bravo 16. They are overlaid on an aerial image showing the Bravo 16 range boundary. The conventional bullseye is depicted as the West triangle and the nuclear target is depicted by the East triangle.

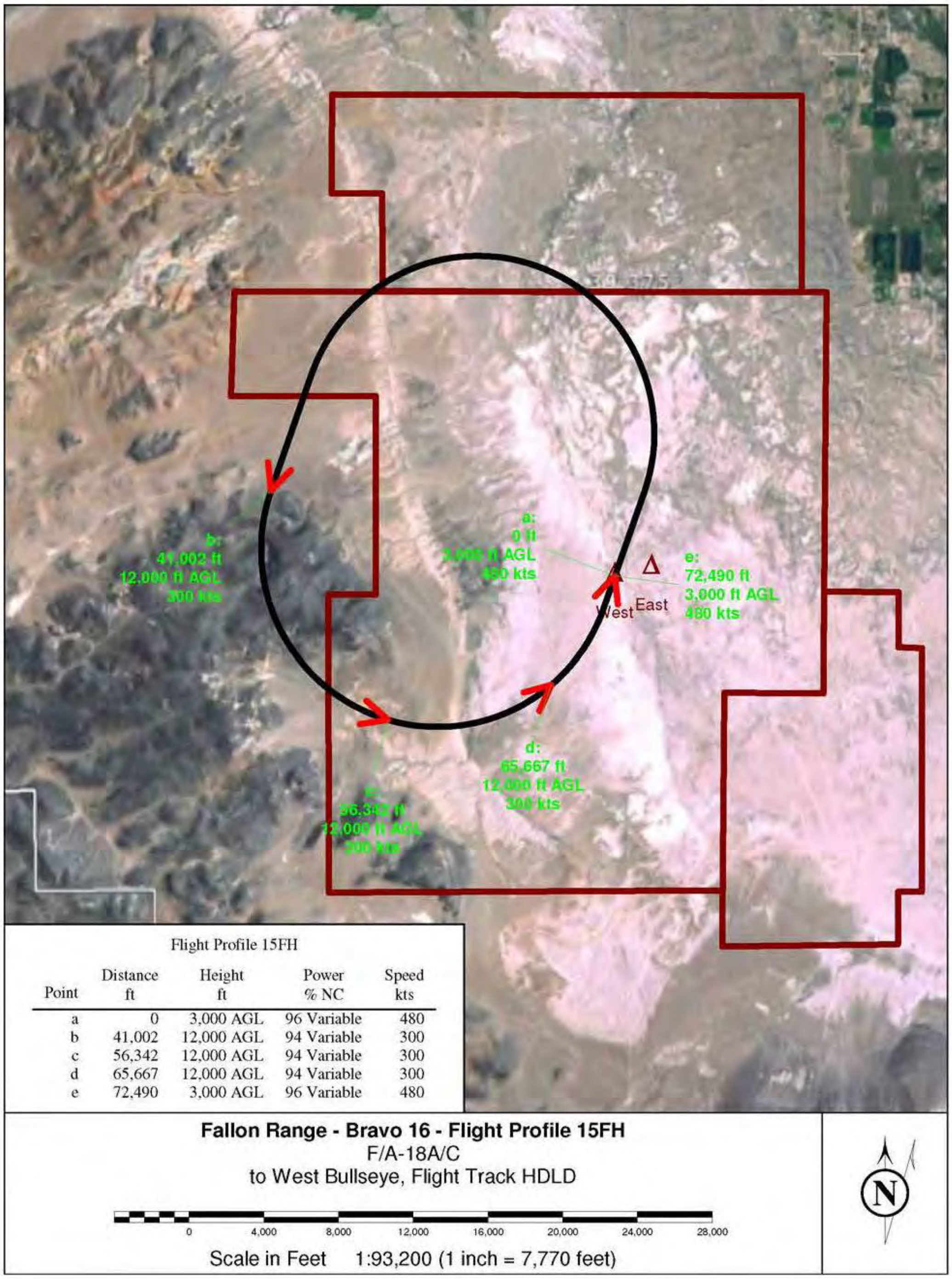
The flight profiles are shown in the following order:

Profile Pages	Aircraft
A-7 - A-10	F/A-18 C/D
A-11 - A-14	F/A – 18 E/F

Each figure includes a table describing the profile parameters of the associated flight track. The columns of the profile data tables are described below:

Column Heading	Description
Point	Sequence letter along flight track denoting change in flight parameters
Distance (feet)	Distance along flight track from runway threshold in feet
Height (feet)	Altitude of aircraft in feet Above Ground Level (AGL) or relative to Mean Sea Level (MSL); In this model, AGL reflects Altitude above Field Elevation (AFE); The reference point is located near the B-16 target with an elevation of 3934 feet MSL.
Power (Appropriate Unit)*	Engine power setting and Drag Configuration/Interpolation Code (defines sets of interpolation code in NOISEMAP (F for FIXED, P for PARALLEL, V for VARIABLE))
Speed (kts)	Indicated airspeed of aircraft in knots
Yaw Angle	Angle of the aircraft relative to its vertical axis in degrees; positive nose left
Angle of Attack (degrees)**	Angle of the aircraft, not of the wing; angle between the climb angle and the pitch angle, in degrees, positive nose up. The climb angle is the angle between the horizontal and the velocity vector (same convention). The pitch angle is the angle between the horizontal and the thrust vector (same convention)
Roll Angle	Angle of the aircraft relative to its longitudinal axis in degrees; positive left side down.
Nacelle Angle (degrees)***	Angle of engine nacelle pylon relative to the horizontal (airplane) mode; positive up; maximum of 90

Notes: * not applicable to rotary wing aircraft
** for rotary wing aircraft only
*** for tiltrotor aircraft (e.g., MV-22B) only; fixed to 90 degrees for RNM helicopters

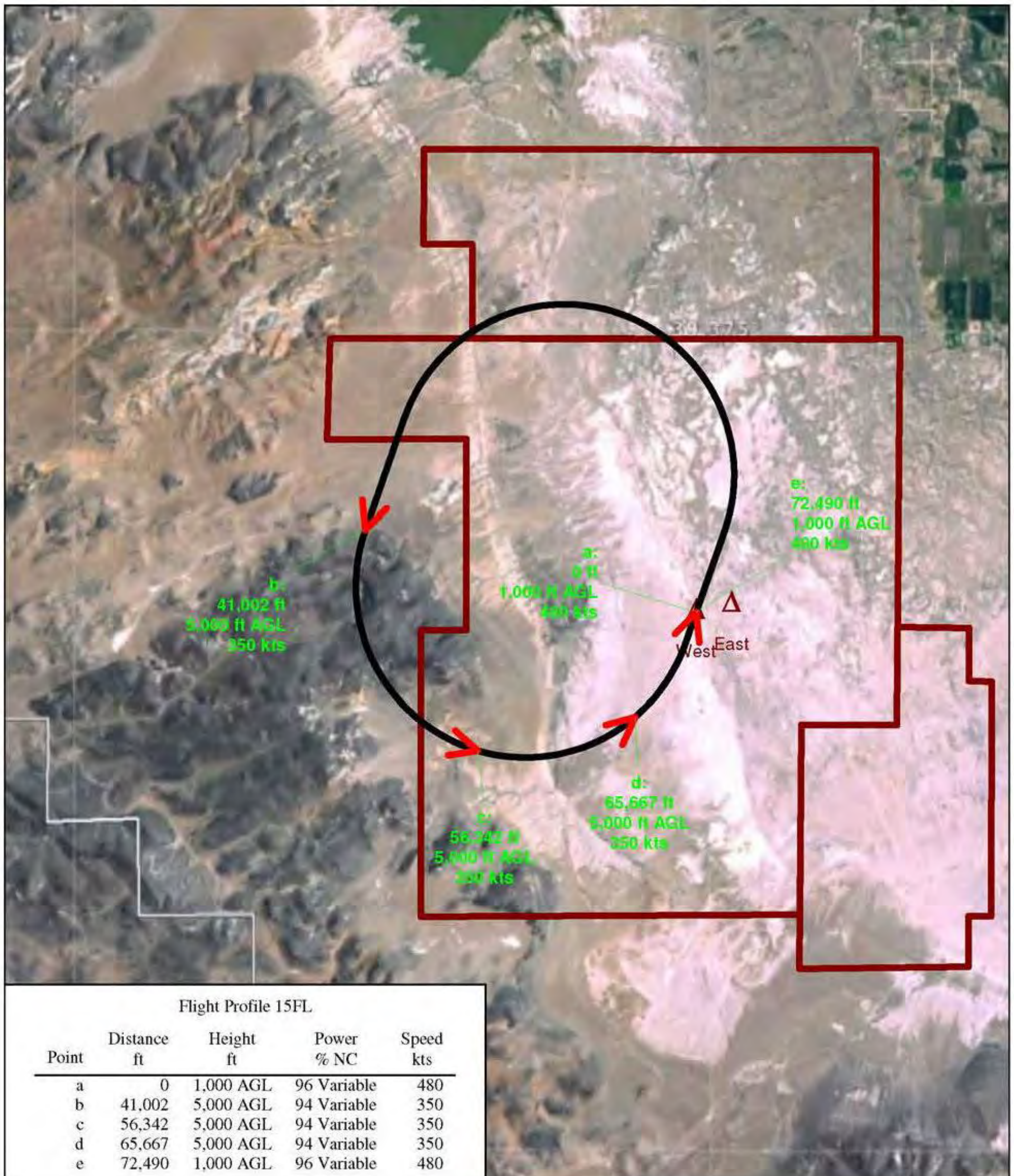


Flight Profile 15FH

Point	Distance ft	Height ft	Power % NC	Speed kts
a	0	3,000 AGL	96 Variable	480
b	41,002	12,000 AGL	94 Variable	300
c	56,342	12,000 AGL	94 Variable	300
d	65,667	12,000 AGL	94 Variable	300
e	72,490	3,000 AGL	96 Variable	480

Fallon Range - Bravo 16 - Flight Profile 15FH
F/A-18A/C
to West Bullseye, Flight Track HDLD

Scale in Feet 1:93,200 (1 inch = 7,770 feet)

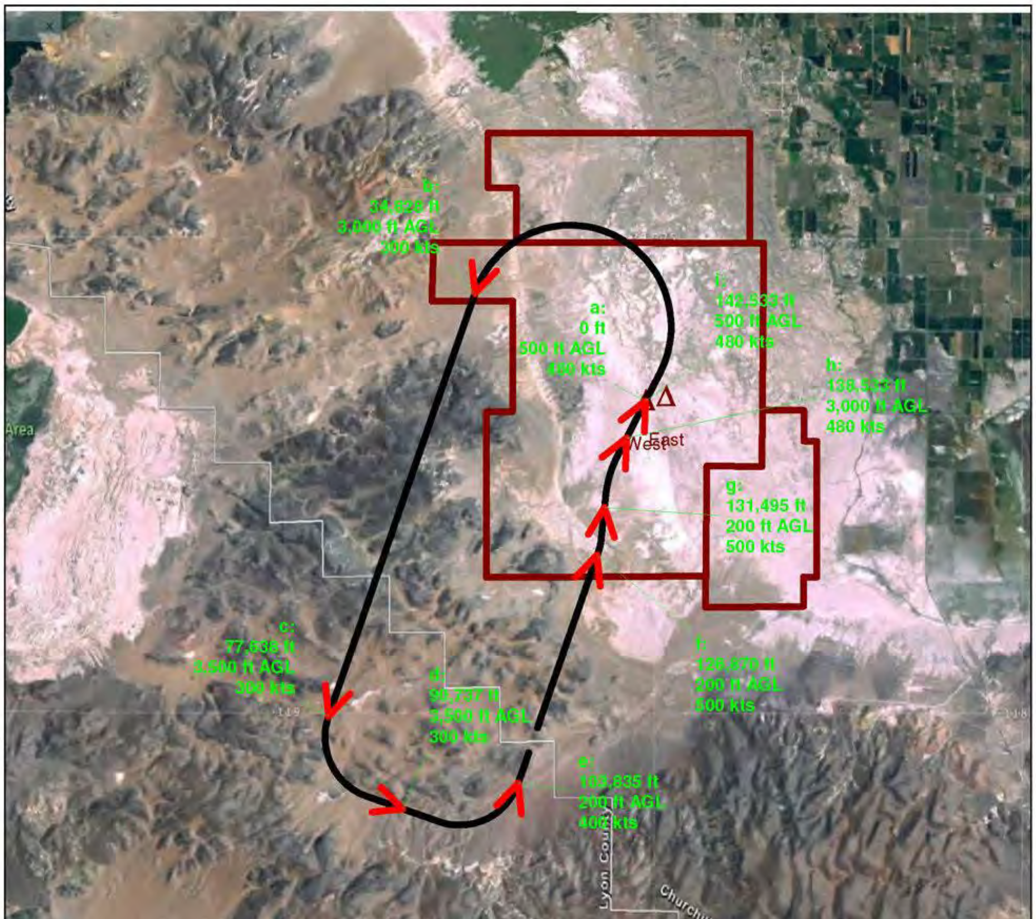


Flight Profile 15FL

Point	Distance ft	Height ft	Power % NC	Speed kts
a	0	1,000 AGL	96 Variable	480
b	41,002	5,000 AGL	94 Variable	350
c	56,342	5,000 AGL	94 Variable	350
d	65,667	5,000 AGL	94 Variable	350
e	72,490	1,000 AGL	96 Variable	480

Fallon Range - Bravo 16 - Flight Profile 15FL
F/A-18A/C
to West Bullseye, Flight Track HDLD

Scale in Feet 1:103,000 (1 inch = 8,600 feet)



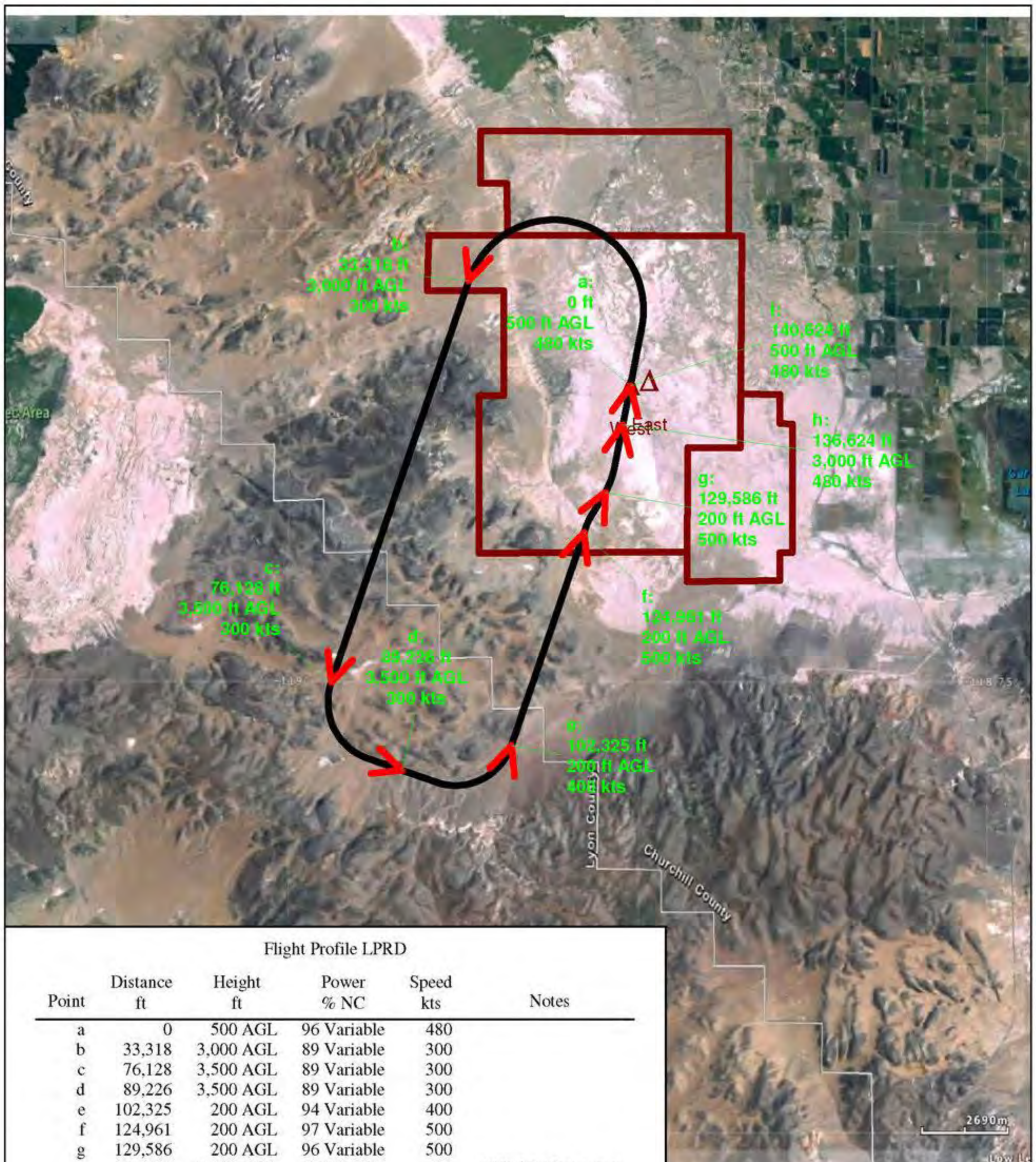
Flight Profile LPLD

Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	500 AGL	96 Variable	480	
b	34,828	3,000 AGL	89 Variable	300	
c	77,638	3,500 AGL	89 Variable	300	
d	90,737	3,500 AGL	89 Variable	300	
e	103,835	200 AGL	94 Variable	400	
f	126,870	200 AGL	97 Variable	500	
g	131,495	200 AGL	96 Variable	500	
h	138,533	3,000 AGL	96 Variable	480	4000 ft before target
i	142,533	500 AGL	96 Variable	480	

Fallon Range - Bravo 16 - Flight Profile LPLD
F/A-18A/C
to West Bullseye, Flight Track LPLD

0 10,000 20,000 30,000 40,000 50,000
Scale in Feet 1:182,000 (1 inch = 15,200 feet)

N



Flight Profile LPRD

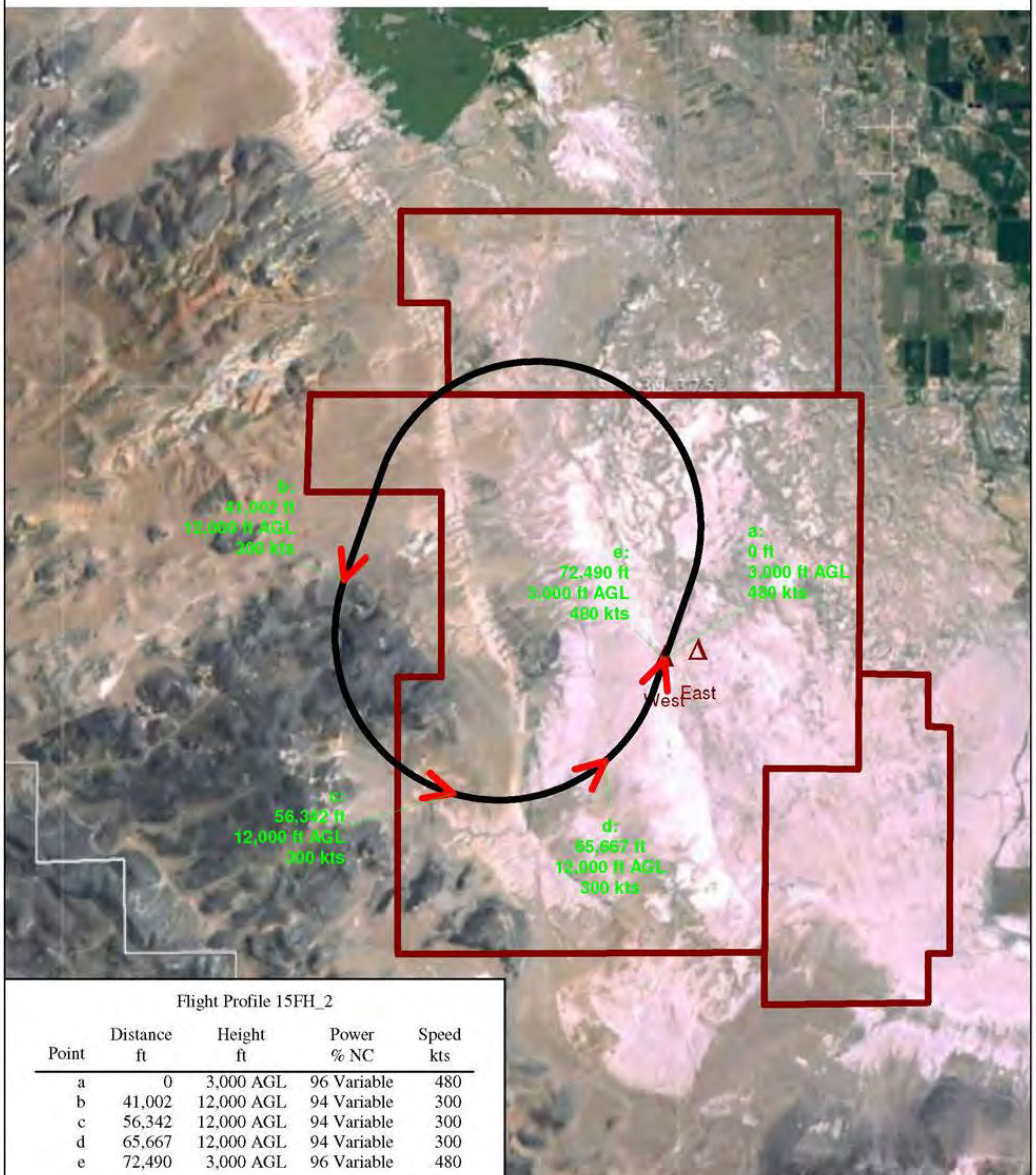
Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	500 AGL	96 Variable	480	
b	33,318	3,000 AGL	89 Variable	300	
c	76,128	3,500 AGL	89 Variable	300	
d	89,226	3,500 AGL	89 Variable	300	
e	102,325	200 AGL	94 Variable	400	
f	124,961	200 AGL	97 Variable	500	
g	129,586	200 AGL	96 Variable	500	
h	136,624	3,000 AGL	96 Variable	480	4000 ft before target
i	140,624	500 AGL	96 Variable	480	

Fallon Range - Bravo 16 - Flight Profile LPRD
F/A-18A/C
to West Bullseye, Flight Track LPRD

0 10,000 20,000 30,000 40,000 50,000 60,000

Scale in Feet 1:192,000 (1 inch = 16,000 feet)

N



Flight Profile 15FH_2

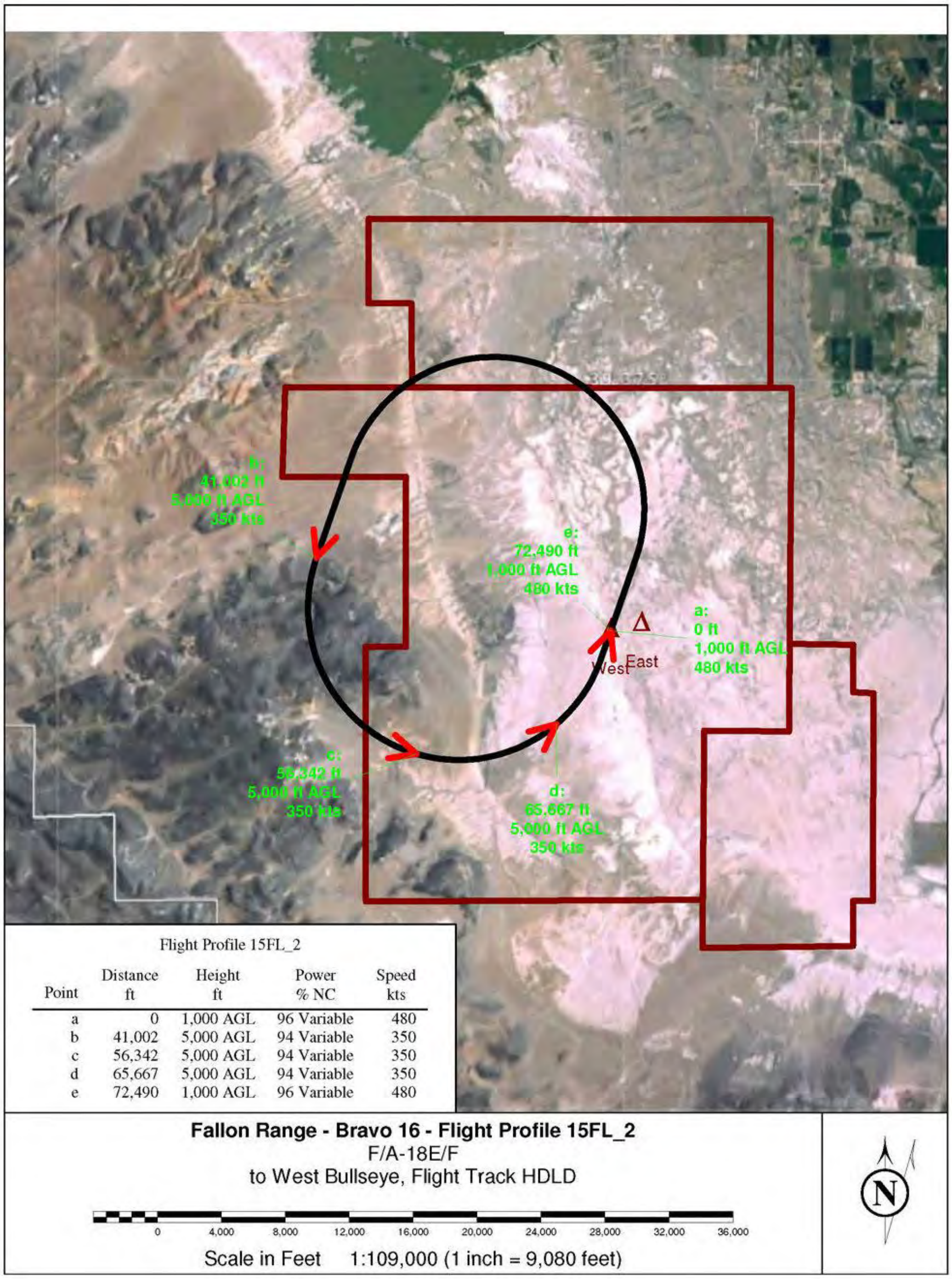
Point	Distance ft	Height ft	Power % NC	Speed kts
a	0	3,000 AGL	96 Variable	480
b	41,002	12,000 AGL	94 Variable	300
c	56,342	12,000 AGL	94 Variable	300
d	65,667	12,000 AGL	94 Variable	300
e	72,490	3,000 AGL	96 Variable	480

Fallon Range - Bravo 16 - Flight Profile 15FH_2
F/A-18E/F
to West Bullseye, Flight Track HDLD

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000

Scale in Feet 1:109,000 (1 inch = 9,080 feet)

N

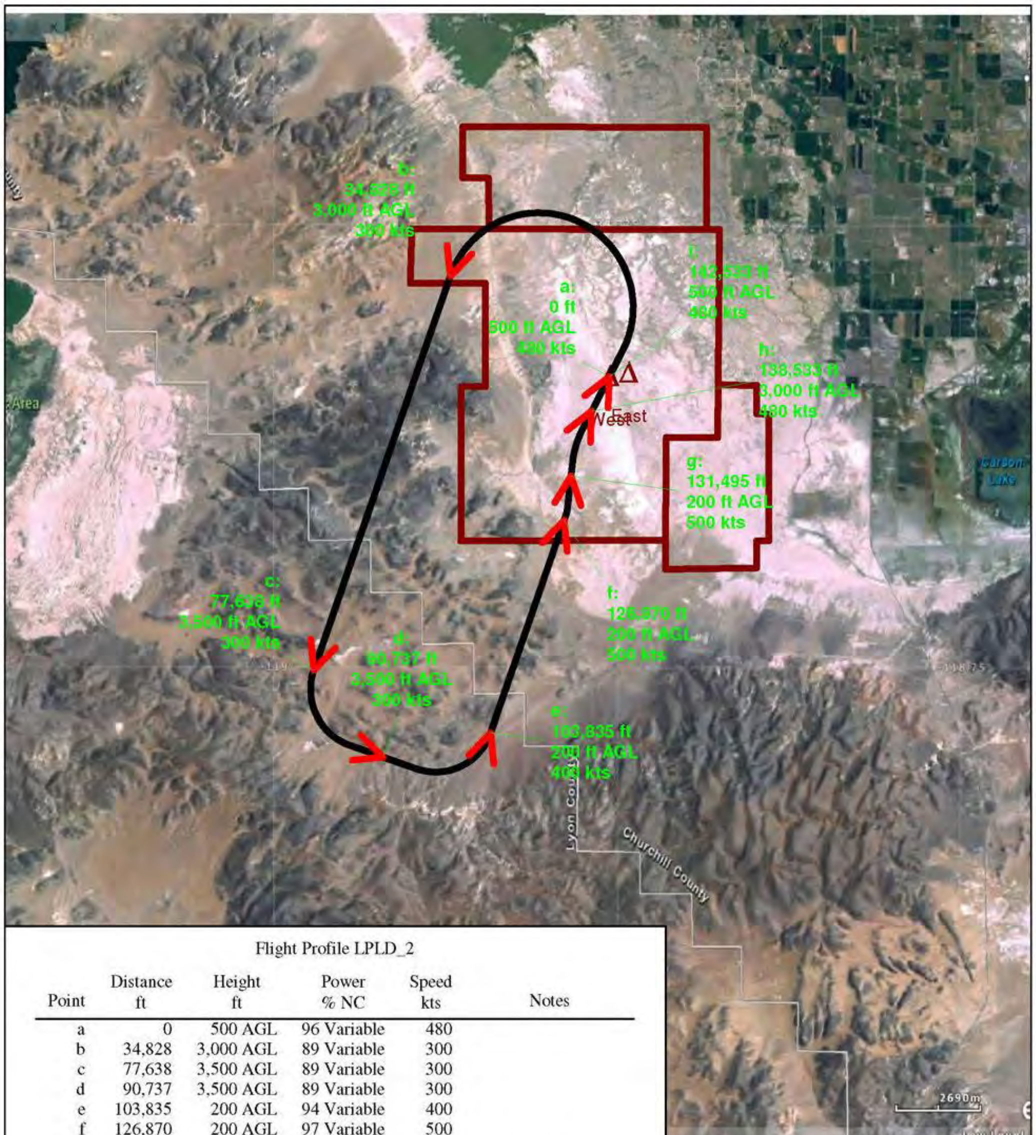


Flight Profile 15FL_2

Point	Distance ft	Height ft	Power % NC	Speed kts
a	0	1,000 AGL	96 Variable	480
b	41,002	5,000 AGL	94 Variable	350
c	56,342	5,000 AGL	94 Variable	350
d	65,667	5,000 AGL	94 Variable	350
e	72,490	1,000 AGL	96 Variable	480

Fallon Range - Bravo 16 - Flight Profile 15FL_2
F/A-18E/F
to West Bullseye, Flight Track HDLD

Scale in Feet 1:109,000 (1 inch = 9,080 feet)



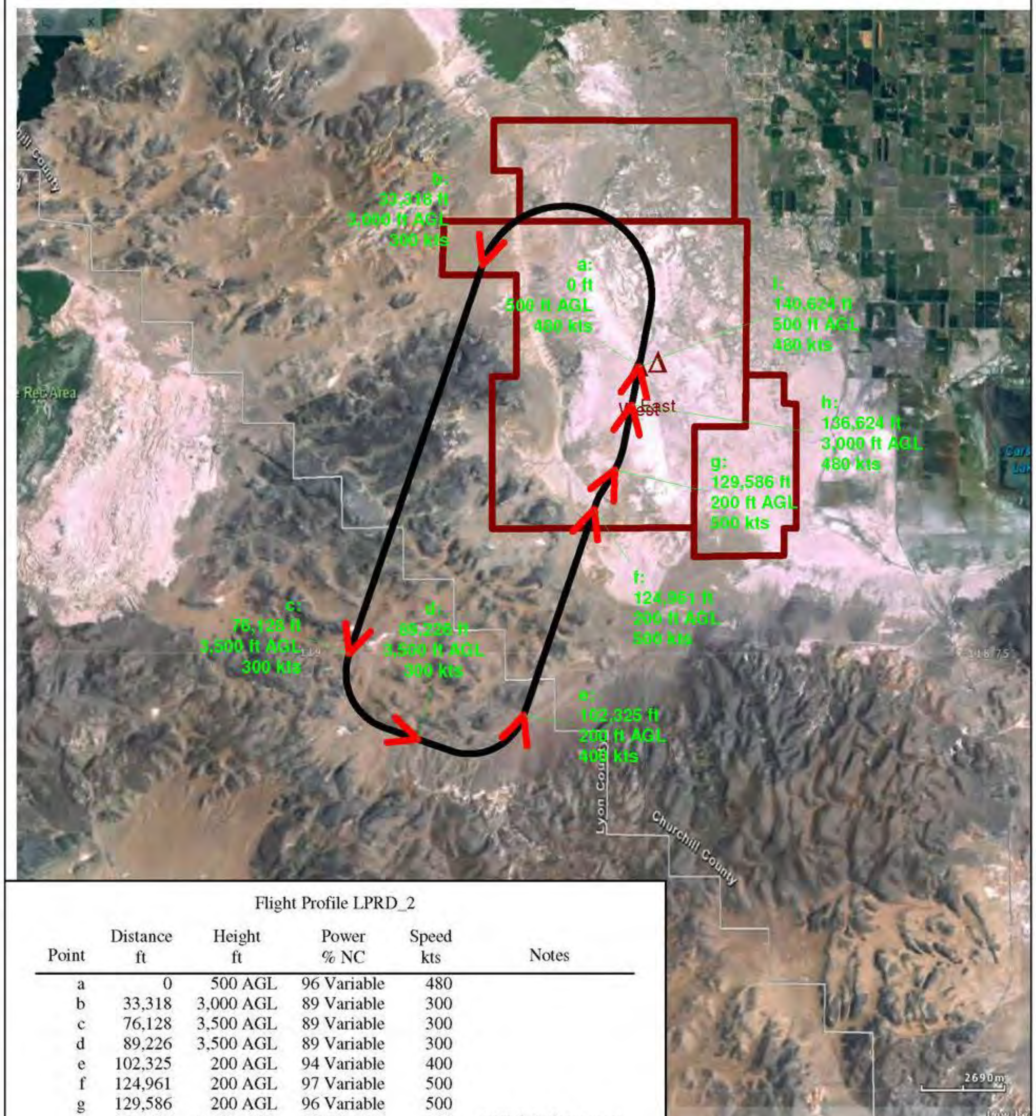
Flight Profile LPLD_2

Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	500 AGL	96 Variable	480	
b	34,828	3,000 AGL	89 Variable	300	
c	77,638	3,500 AGL	89 Variable	300	
d	90,737	3,500 AGL	89 Variable	300	
e	103,835	200 AGL	94 Variable	400	
f	126,870	200 AGL	97 Variable	500	
g	131,495	200 AGL	96 Variable	500	
h	138,533	3,000 AGL	96 Variable	480	4000 ft before target
i	142,533	500 AGL	96 Variable	480	

Fallon Range - Bravo 16 - Flight Profile LPLD_2
F/A-18E/F
to West Bullseye, Flight Track LPLD

0 10,000 20,000 30,000 40,000 50,000 60,000

Scale in Feet 1:195,000 (1 inch = 16,300 feet)



Flight Profile LPRD_2

Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	500 AGL	96 Variable	480	
b	33,318	3,000 AGL	89 Variable	300	
c	76,128	3,500 AGL	89 Variable	300	
d	89,226	3,500 AGL	89 Variable	300	
e	102,325	200 AGL	94 Variable	400	
f	124,961	200 AGL	97 Variable	500	
g	129,586	200 AGL	96 Variable	500	
h	136,624	3,000 AGL	96 Variable	480	4000 ft before target
i	140,624	500 AGL	96 Variable	480	

Fallon Range - Bravo 16 - Flight Profile LPRD_2
F/A-18E/F
to West Bullseye, Flight Track LPRD

0 10,000 20,000 30,000 40,000 50,000 60,000

Scale in Feet 1:198,000 (1 inch = 16,500 feet)

N

Table A-4 Bravo 17 Modeled Profiles and Operations for Baseline (CY2010)

Airspace ID	Mission ID	Aircraft ID	Speed (KIAS)	Power Description	Power Setting	Units	Period of Day	Busy month Ops	Minutes per sortie	Altitude Range (ft) 25K-30K	100-200	200-300	500-1000	500-11K	7K-17K	11K-18K	12K-18K	17K-17K	18K-25K	18K-30K
SUP	F5_1	F-5E	350	TAKEOFF POWER	101	% RPM	daytime	123	12					10		55				35
SUP	F5_1	F-5E	350	TAKEOFF POWER	101	% RPM	nighttime	1	12					10		55				35
1B1P_1	F18_1	F-18	500	TRAINING ROUTE	92	% NC	daytime	306	10	25							25		50	
1B1P_1	F18_1	F-18	500	TRAINING ROUTE	92	% NC	nighttime	3	10	25							25		50	
1B1P_1	F18E_1	F-18E&F	500	HIGH SPD TRAINING RT	90.5	% N2	daytime	263	10	25							25		56	
1B1P_1	F18E_1	F-18E&F	500	HIGH SPD TRAINING RT	90.5	% N2	nighttime	3	10	25							25		56	
1B1P_1	F16_1	F-16(G100)	465	LOW SPD TRAINING RT	94	% NC	daytime	32	10	25							25		50	
1B1P_2	F18_1	F-18	500	TRAINING ROUTE	92	% NC	daytime	306	10	25							25		50	
1B1P_2	F18_1	F-18	500	TRAINING ROUTE	92	% NC	nighttime	3	10	25							25		50	
1B1P_2	F18E_1	F-18E&F	500	HIGH SPD TRAINING RT	90.5	% N2	daytime	263	10	25							25		56	
1B1P_2	F18E_1	F-18E&F	500	HIGH SPD TRAINING RT	90.5	% N2	nighttime	3	10	25							25		56	
1B1P_2	F16_1	F-16(G100)	465	LOW SPD TRAINING RT	94	% NC	daytime	32	10	25							25		50	
CAS_FGT	F18_FGT	F-18	500	TRAINING ROUTE	92	% NC	daytime	535	20						100					
CAS_FGT	F18_FGT	F-18	500	TRAINING ROUTE	92	% NC	nighttime	5	20						100					
CAS_FGT	F18E_FGT	F-18E&F	500	HIGH SPD TRAINING RT	90.5	% N2	daytime	462	20						100					
CAS_FGT	F18E_FGT	F-18E&F	500	HIGH SPD TRAINING RT	90.5	% N2	nighttime	5	20						100					
CAS_FGT	F16_FGT	F-16(G100)	465	LOW SPD TRAINING RT	94	% NC	daytime	57	20						100					
CAS_FGT	F16_FGT	F-16(G100)	465	LOW SPD TRAINING RT	94	% NC	nighttime	1	20						100					
CAS_SW	F18_IN	F-18	400	CRUISE POWER	90	% NC	daytime	535	20									100		
CAS_SW	F18_IN	F-18	400	CRUISE POWER	90	% NC	nighttime	5	20									100		
CAS_SW	F18E_IN	F-18E/F	400	TAKEOFF POWER	90	% N2	daytime	462	20									100		
CAS_SW	F18E_IN	F-18E/F	400	TAKEOFF POWER	90	% N2	nighttime	5	20									100		
CAS_SW	F16_IN	F-16(G100)	465	LOW SPD TRAINING RT	94	% NC	daytime	57	20									100		
CAS_SW	F16_IN	F-16(G100)	465	LOW SPD TRAINING RT	94	% NC	nighttime	1	20									100		
CAS_N	F18_IN	F-18	400	CRUISE POWER	90	% NC	daytime	535	20									100		
CAS_N	F18_IN	F-18	400	CRUISE POWER	90	% NC	nighttime	5	20									100		
CAS_N	F18E_IN	F-18E/F	400	TAKEOFF POWER	90	% N2	daytime	462	20									100		
CAS_N	F18E_IN	F-18E/F	400	TAKEOFF POWER	90	% N2	nighttime	5	20									100		
CAS_N	F16_IN	F-16(G100)	465	LOW SPD TRAINING RT	94	% NC	daytime	57	20									100		
CAS_N	F16_IN	F-16(G100)	465	LOW SPD TRAINING RT	94	% NC	nighttime	1	20									100		
CAS2	H60_2	UH60A	40	TKF LOAD 0 KTS	40	KNOTS	daytime	31	55			100								
CAS3	H60_2	UH60A	40	TKF LOAD 0 KTS	40	KNOTS	daytime	31	55			100								
NSW2	H60_4	UH60A	40	TKF LOAD 0 KTS	40	KNOTS	daytime	21	55		100									
NSW4	H60_3	UH60A	110	LFO LOAD 100 KTS	100	KNOTS	daytime	21	3		100									
CONV	F18_CON	F-18	450	TAKEOFF POWER	96.5	% NC	daytime	1,147					100							
CONV	F18_CON	F-18	450	TAKEOFF POWER	96.5	% NC	nighttime	12					100							
CONV	F18E_CON	F-18E/F	450	TAKEOFF POWER	96.5	% N2	daytime	976					100							
CONV	F18E_CON	F-18E/F	450	TAKEOFF POWER	96.5	% N2	nighttime	10					100							
CONV	F16_CON	F-16(G100)	450	TAKEOFF POWER	104	% NC	daytime	122					100							
CONV	F16_CON	F-16(G100)	450	TAKEOFF POWER	104	% NC	nighttime	1					100							
STRA	F18_CON	F-18	450	TAKEOFF POWER	96.5	% NC	daytime	1,147					100							
STRA	F18_CON	F-18	450	TAKEOFF POWER	96.5	% NC	nighttime	12					100							
STRA	F18E_CON	F-18E/F	450	TAKEOFF POWER	96.5	% N2	daytime	976					100							
STRA	F18E_CON	F-18E/F	450	TAKEOFF POWER	96.5	% N2	nighttime	10					100							
STRA	F16_CON	F-16(G100)	450	TAKEOFF POWER	104	% NC	daytime	122					100							
STRA	F16_CON	F-16(G100)	450	TAKEOFF POWER	104	% NC	nighttime	1					100							
FIRI	F18_FI	20MMGU	650	CRUISE POWER	70	% RPM	daytime	1,147					100							
FIRI	F18_FI	20MMGU	650	CRUISE POWER	70	% RPM	nighttime	12					100							
FIRI	F18E_FI	20MMGU	650	CRUISE POWER	70	% RPM	daytime	976					100							
FIRI	F18E_FI	20MMGU	650	CRUISE POWER	70	% RPM	nighttime	10					100							
FIRI	F16_FI	20MMGU	650	CRUISE POWER	70	% RPM	daytime	122					100							
FIRI	F16_FI	20MMGU	650	CRUISE POWER	70	% RPM	nighttime	1					100							
CAS1	H60_1	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	31				100								
CAS4	H60_1	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	31				100								
CAS5	H60_1	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	31				100								
CAS6	H60_1	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	31				100								
CAS7	H60_1	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	31				100								
NSW1	H60_3	UH60A	110	LFO LOAD 100 KTS	100	KNOTS	daytime	21			100									
NSW3	H60_3	UH60A	110	LFO LOAD 100 KTS	100	KNOTS	daytime	21			100									
NSW5	H60_3	UH60A	110	LFO LOAD 100 KTS	100	KNOTS	daytime	21			100									

Table A-5 Bravo 17 Modeled Profiles and Operations for Prospective (CY2015)

Airspace ID	Mission ID	Aircraft ID	Speed (KIAS)	Power Description	Power Setting	Units	Period of Day	Busy month Sorties	Minutes per sortie	Altitude Range (ft)										
										25K-30K	100-200	200-300	500-1000	500-11K	7K-17K	11K-18K	12K-18K	17K-17K	18K-25K	18K-30K
SUP	F5_1	F-5E	350	TAKEOFF POWER	101	% RPM	daytime	135	12					10		55				35
SUP	F5_1	F-5E	350	TAKEOFF POWER	101	% RPM	nighttime	1	12					10		55				35
1B1P_1	F18_1	F-18	500	TRAINING ROUTE	92	% NC	daytime	280	10	25							25		50	
1B1P_1	F18_1	F-18	500	TRAINING ROUTE	92	% NC	nighttime	3	10	25							25		50	
1B1P_1	F18E_1	F-18E&F	500	HIGH SPD TRAINING RT	90.5	% N2	daytime	354	10	25							25		56	
1B1P_1	F18E_1	F-18E&F	500	HIGH SPD TRAINING RT	90.5	% N2	nighttime	3	10	25							25		56	
1B1P_1	F16_1	F-16(G100	465	LOW SPD TRAINING RT	94	% NC	daytime	36	10	25							25		50	
1B1P_2	F18_1	F-18	500	TRAINING ROUTE	92	% NC	daytime	280	10	25							25		50	
1B1P_2	F18_1	F-18	500	TRAINING ROUTE	92	% NC	nighttime	3	10	25							25		50	
1B1P_2	F18E_1	F-18E&F	500	HIGH SPD TRAINING RT	90.5	% N2	daytime	354	10	25							25		56	
1B1P_2	F18E_1	F-18E&F	500	HIGH SPD TRAINING RT	90.5	% N2	nighttime	3	10	25							25		56	
1B1P_2	F16_1	F-16(G100	465	LOW SPD TRAINING RT	94	% NC	daytime	36	10	25							25		50	
CAS_FGT	F18_FGT	F-18	500	TRAINING ROUTE	92	% NC	daytime	491	20						100					
CAS_FGT	F18_FGT	F-18	500	TRAINING ROUTE	92	% NC	nighttime	5	20						100					
CAS_FGT	F18E_FGT	F-18E&F	500	HIGH SPD TRAINING RT	90.5	% N2	daytime	619	20						100					
CAS_FGT	F18E_FGT	F-18E&F	500	HIGH SPD TRAINING RT	90.5	% N2	nighttime	6	20						100					
CAS_FGT	F16_FGT	F-16(G100	465	LOW SPD TRAINING RT	94	% NC	daytime	62	20						100					
CAS_FGT	F16_FGT	F-16(G100	465	LOW SPD TRAINING RT	94	% NC	nighttime	1	20						100					
CAS_SW	F18_IN	F-18	400	CRUISE POWER	90	% NC	daytime	491	20									100		
CAS_SW	F18_IN	F-18	400	CRUISE POWER	90	% NC	nighttime	5	20									100		
CAS_SW	F18E_IN	F-18E/F	400	TAKEOFF POWER	90	% N2	daytime	619	20									100		
CAS_SW	F18E_IN	F-18E/F	400	TAKEOFF POWER	90	% N2	nighttime	6	20									100		
CAS_SW	F16_IN	F-16(G100	465	LOW SPD TRAINING RT	94	% NC	daytime	62	20									100		
CAS_SW	F16_IN	F-16(G100	465	LOW SPD TRAINING RT	94	% NC	nighttime	1	20									100		
CAS_N	F18_IN	F-18	400	CRUISE POWER	90	% NC	daytime	491	20									100		
CAS_N	F18_IN	F-18	400	CRUISE POWER	90	% NC	nighttime	5	20									100		
CAS_N	F18E_IN	F-18E/F	400	TAKEOFF POWER	90	% N2	daytime	619	20									100		
CAS_N	F18E_IN	F-18E/F	400	TAKEOFF POWER	90	% N2	nighttime	6	20									100		
CAS_N	F16_IN	F-16(G100	465	LOW SPD TRAINING RT	94	% NC	daytime	62	20									100		
CAS_N	F16_IN	F-16(G100	465	LOW SPD TRAINING RT	94	% NC	nighttime	1	20									100		
CAS2	H60_2	UH60A	40	TKF LOAD 0 KTS	40	KNOTS	daytime	34	55			100								
CAS3	H60_2	UH60A	40	TKF LOAD 0 KTS	40	KNOTS	daytime	34	55			100								
NSW2	H60_4	UH60A	40	TKF LOAD 0 KTS	40	KNOTS	daytime	23	55		100									
NSW4	H60_3	UH60A	110	LFO LOAD 100 KTS	100	KNOTS	daytime	23	3		100									
CONV	F18_CON	F-18	450	TAKEOFF POWER	96.5	% NC	daytime	1,051					100							
CONV	F18_CON	F-18	450	TAKEOFF POWER	96.5	% NC	nighttime	11					100							
CONV	F18E_CON	F-18E/F	450	TAKEOFF POWER	96.5	% N2	daytime	1,285					100							
CONV	F18E_CON	F-18E/F	450	TAKEOFF POWER	96.5	% N2	nighttime	13					100							
CONV	F16_CON	F-16(G100	450	TAKEOFF POWER	104	% NC	daytime	134					100							
CONV	F16_CON	F-16(G100	450	TAKEOFF POWER	104	% NC	nighttime	1					100							
STRA	F18_CON	F-18	450	TAKEOFF POWER	96.5	% NC	daytime	1,051					100							
STRA	F18_CON	F-18	450	TAKEOFF POWER	96.5	% NC	nighttime	11					100							
STRA	F18E_CON	F-18E/F	450	TAKEOFF POWER	96.5	% N2	daytime	1,285					100							
STRA	F18E_CON	F-18E/F	450	TAKEOFF POWER	96.5	% N2	nighttime	13					100							
STRA	F16_CON	F-16(G100	450	TAKEOFF POWER	104	% NC	daytime	134					100							
STRA	F16_CON	F-16(G100	450	TAKEOFF POWER	104	% NC	nighttime	1					100							
FIRI	F18_FI	20MMGU	650	CRUISE POWER	70	% RPM	daytime	1,051					100							
FIRI	F18_FI	20MMGU	650	CRUISE POWER	70	% RPM	nighttime	11					100							
FIRI	F18E_FI	20MMGU	650	CRUISE POWER	70	% RPM	daytime	1,285					100							
FIRI	F18E_FI	20MMGU	650	CRUISE POWER	70	% RPM	nighttime	13					100							
FIRI	F16_FI	20MMGU	650	CRUISE POWER	70	% RPM	daytime	134					100							
FIRI	F16_FI	20MMGU	650	CRUISE POWER	70	% RPM	nighttime	1					100							
CAS1	H60_1	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	34				100								
CAS4	H60_1	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	34				100								
CAS5	H60_1	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	34				100								
CAS6	H60_1	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	34				100								
CAS7	H60_1	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	34				100								
NSW1	H60_3	UH60A	110	LFO LOAD 100 KTS	100	KNOTS	daytime	23			100									
NSW3	H60_3	UH60A	110	LFO LOAD 100 KTS	100	KNOTS	daytime	23			100									
NSW5	H60_3	UH60A	110	LFO LOAD 100 KTS	100	KNOTS	daytime	23			100									

Table A-6 Bravo 19 Modeled Profiles and Operations for Baseline (CY2010)

Airspace ID	Mission ID	Aircraft ID	Speed (KIAS)	Power Description	Power Setting	Units	Period of Day	Busy month Ops	Minutes per sortie	Altitude Range (ft) 100 200	200 300	500 1000	7k 15k	15k 15k
CAS_2F	F18_SA	F-18	350	TAKEOFF POWER	96.5	% NC	daytime	80	5				100	
CAS_2F	F18_SA	F-18	350	TAKEOFF POWER	96.5	% NC	nighttime	1	5				100	
CAS_2F	F18E_SA	F-18E/F	325	TAKEOFF POWER	96	% N2	daytime	87	5				100	
CAS_2F	F18E_SA	F-18E/F	325	TAKEOFF POWER	96	% N2	nighttime	1	5				100	
CAS_2F	F16_SA	F-16(G100)	350	TAKEOFF POWER	104	% NC	daytime	12	5				100	
CAS_2F	F16_SA	F-16(G100)	350	TAKEOFF POWER	104	% NC	nighttime	0	5				100	
AG2_2	H60_2	UH60A	100	LFO LOAD 100 KTS	100	KNOTS	daytime	5	55	100				
CAS_3	H60_4	UH60A	40	TKF LOAD 0 KTS	40	KNOTS	daytime	8	55		100			
CAS_4	H60_4	UH60A	40	TKF LOAD 0 KTS	40	KNOTS	daytime	8	55		100			
CASE	F18_CW	F-18	500	TRAINING ROUTE	92	% NC	daytime	240					100	
CASE	F18_CW	F-18	500	TRAINING ROUTE	92	% NC	nighttime	2					100	
CASE	F18E_CW	F-18E/F	400	TAKEOFF POWER	96	% N2	daytime	260					100	
CASE	F18E_CW	F-18E/F	400	TAKEOFF POWER	96	% N2	nighttime	3					100	
CASE	F16_CW	F-16(G100)	350	TAKEOFF POWER	104	% NC	daytime	36					100	
CASE	F16_CW	F-16(G100)	350	TAKEOFF POWER	104	% NC	nighttime	0					100	
CASNW	F18_CW	F-18	500	TRAINING ROUTE	92	% NC	daytime	240					100	
CASNW	F18_CW	F-18	500	TRAINING ROUTE	92	% NC	nighttime	2					100	
CASNW	F18E_CW	F-18E/F	400	TAKEOFF POWER	96	% N2	daytime	260					100	
CASNW	F18E_CW	F-18E/F	400	TAKEOFF POWER	96	% N2	nighttime	3					100	
CASNW	F16_CW	F-16(G100)	350	TAKEOFF POWER	104	% NC	daytime	36					100	
CASNW	F16_CW	F-16(G100)	350	TAKEOFF POWER	104	% NC	nighttime	0					100	
CASNC	F18_CW	F-18	500	TRAINING ROUTE	92	% NC	daytime	240					100	
CASNC	F18_CW	F-18	500	TRAINING ROUTE	92	% NC	nighttime	2					100	
CASNC	F18E_CW	F-18E/F	400	TAKEOFF POWER	96	% N2	daytime	260					100	
CASNC	F18E_CW	F-18E/F	400	TAKEOFF POWER	96	% N2	nighttime	3					100	
CASNC	F16_CW	F-16(G100)	350	TAKEOFF POWER	104	% NC	daytime	36					100	
CASNC	F16_CW	F-16(G100)	350	TAKEOFF POWER	104	% NC	nighttime	0					100	
CASNE	F18_CW	F-18	500	TRAINING ROUTE	92	% NC	daytime	240					100	
CASNE	F18_CW	F-18	500	TRAINING ROUTE	92	% NC	nighttime	2					100	
CASNE	F18E_CW	F-18E/F	400	TAKEOFF POWER	96	% N2	daytime	260					100	
CASNE	F18E_CW	F-18E/F	400	TAKEOFF POWER	96	% N2	nighttime	3					100	
CASNE	F16_CW	F-16(G100)	350	TAKEOFF POWER	104	% NC	daytime	36					100	
CASNE	F16_CW	F-16(G100)	350	TAKEOFF POWER	104	% NC	nighttime	0					100	
CAS_1F	F18_ST	F-18	400	CRUISE POWER	88	% NC	daytime	799						100
CAS_1F	F18_ST	F-18	400	CRUISE POWER	88	% NC	nighttime	8						100
CAS_1F	F18E_ST	F-18E/F	350	CRUISE POWER	85	% N2	daytime	866						100
CAS_1F	F18E_ST	F-18E/F	350	CRUISE POWER	85	% N2	nighttime	9						100
CAS_1F	F16_ST	F-16(G100)	350	INTERMEDIATE POWER	90	% NC	daytime	121						100
CAS_1F	F16_ST	F-16(G100)	350	INTERMEDIATE POWER	90	% NC	nighttime	1						100
AG1	H60_1	UH60A	80	LFO LOAD 70 KTS	70	KNOTS	daytime	5		100				
AG2_1	H60_2	UH60A	100	LFO LOAD 100 KTS	100	KNOTS	daytime	5		100				
AG2_3	H60_2	UH60A	100	LFO LOAD 100 KTS	100	KNOTS	daytime	5		100				
AG2_4	H60_2	UH60A	100	LFO LOAD 100 KTS	100	KNOTS	daytime	5		100				
AG2_5	H60_2	UH60A	100	LFO LOAD 100 KTS	100	KNOTS	daytime	5		100				
CAS_1	H60_3	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	8			100			
CAS_2	H60_3	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	8			100			
CAS_5	H60_3	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	8			100			
CAS_6	H60_3	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	8			100			
CAS_7	H60_3	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	8			100			
CAS_8	H60_3	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	8			100			
CAS_9	H60_3	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	8			100			
CSAR	H60_1	UH60A	80	LFO LOAD 70 KTS	70	KNOTS	daytime	2		100				
STRFFIRE	STRFIRE	20MMGU	650	CRUISE POWER	70	% RPM	daytime	19				100		

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Table A-7 Bravo 19 Modeled Profiles and Operations for Prospective (CY2015)

Airspace ID	Mission ID	Aircraft ID	Speed (KIAS)	Power Description	Power Setting	Units	Period of Day	Busy month Ops	Minutes per sortie	Altitude Range (ft)				
										100 200	200 300	500 1000	7k 15k	15k 15k
CAS_2F	F18_SA	F-18	350	TAKEOFF POWER	96.5	% NC	daytime	82	5				100	
CAS_2F	F18_SA	F-18	350	TAKEOFF POWER	96.5	% NC	nighttime	1	5				100	
CAS_2F	F18E_SA	F-18E/F	325	TAKEOFF POWER	96	% N2	daytime	101	5				100	
CAS_2F	F18E_SA	F-18E/F	325	TAKEOFF POWER	96	% N2	nighttime	1	5				100	
CAS_2F	F16_SA	F-16(G100)	350	TAKEOFF POWER	104	% NC	daytime	13	5				100	
CAS_2F	F16_SA	F-16(G100)	350	TAKEOFF POWER	104	% NC	nighttime	0	5				100	
AG2_2	H60_2	UH60A	100	LFO LOAD 100 KTS	100	KNOTS	daytime	5	55	100				
CAS_3	H60_4	UH60A	40	TKF LOAD 0 KTS	40	KNOTS	daytime	8	55		100			
CAS_4	H60_4	UH60A	40	TKF LOAD 0 KTS	40	KNOTS	daytime	8	55		100			
CASE	F18_CW	F-18	500	TRAINING ROUTE	92	% NC	daytime	246					100	
CASE	F18_CW	F-18	500	TRAINING ROUTE	92	% NC	nighttime	3					100	
CASE	F18E_CW	F-18E/F	400	TAKEOFF POWER	96	% N2	daytime	302					100	
CASE	F18E_CW	F-18E/F	400	TAKEOFF POWER	96	% N2	nighttime	3					100	
CASE	F16_CW	F-16(G100)	350	TAKEOFF POWER	104	% NC	daytime	40					100	
CASE	F16_CW	F-16(G100)	350	TAKEOFF POWER	104	% NC	nighttime	0					100	
CASNW	F18_CW	F-18	500	TRAINING ROUTE	92	% NC	daytime	246					100	
CASNW	F18_CW	F-18	500	TRAINING ROUTE	92	% NC	nighttime	3					100	
CASNW	F18E_CW	F-18E/F	400	TAKEOFF POWER	96	% N2	daytime	302					100	
CASNW	F18E_CW	F-18E/F	400	TAKEOFF POWER	96	% N2	nighttime	3					100	
CASNW	F16_CW	F-16(G100)	350	TAKEOFF POWER	104	% NC	daytime	40					100	
CASNW	F16_CW	F-16(G100)	350	TAKEOFF POWER	104	% NC	nighttime	0					100	
CASNC	F18_CW	F-18	500	TRAINING ROUTE	92	% NC	daytime	246					100	
CASNC	F18_CW	F-18	500	TRAINING ROUTE	92	% NC	nighttime	3					100	
CASNC	F18E_CW	F-18E/F	400	TAKEOFF POWER	96	% N2	daytime	302					100	
CASNC	F18E_CW	F-18E/F	400	TAKEOFF POWER	96	% N2	nighttime	3					100	
CASNC	F16_CW	F-16(G100)	350	TAKEOFF POWER	104	% NC	daytime	40					100	
CASNC	F16_CW	F-16(G100)	350	TAKEOFF POWER	104	% NC	nighttime	0					100	
CASNE	F18_CW	F-18	500	TRAINING ROUTE	92	% NC	daytime	246					100	
CASNE	F18_CW	F-18	500	TRAINING ROUTE	92	% NC	nighttime	3					100	
CASNE	F18E_CW	F-18E/F	400	TAKEOFF POWER	96	% N2	daytime	302					100	
CASNE	F18E_CW	F-18E/F	400	TAKEOFF POWER	96	% N2	nighttime	3					100	
CASNE	F16_CW	F-16(G100)	350	TAKEOFF POWER	104	% NC	daytime	40					100	
CASNE	F16_CW	F-16(G100)	350	TAKEOFF POWER	104	% NC	nighttime	0					100	
CAS_1F	F18_ST	F-18	400	CRUISE POWER	88	% NC	daytime	819						100
CAS_1F	F18_ST	F-18	400	CRUISE POWER	88	% NC	nighttime	8						100
CAS_1F	F18E_ST	F-18E/F	350	CRUISE POWER	85	% N2	daytime	1,007						100
CAS_1F	F18E_ST	F-18E/F	350	CRUISE POWER	85	% N2	nighttime	10						100
CAS_1F	F16_ST	F-16(G100)	350	INTERMEDIATE POWER	90	% NC	daytime	134						100
CAS_1F	F16_ST	F-16(G100)	350	INTERMEDIATE POWER	90	% NC	nighttime	1						100
AG1	H60_1	UH60A	80	LFO LOAD 70 KTS	70	KNOTS	daytime	5		100				
AG2_1	H60_2	UH60A	100	LFO LOAD 100 KTS	100	KNOTS	daytime	5		100				
AG2_3	H60_2	UH60A	100	LFO LOAD 100 KTS	100	KNOTS	daytime	5		100				
AG2_4	H60_2	UH60A	100	LFO LOAD 100 KTS	100	KNOTS	daytime	5		100				
AG2_5	H60_2	UH60A	100	LFO LOAD 100 KTS	100	KNOTS	daytime	5		100				
CAS_1	H60_3	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	8			100			
CAS_2	H60_3	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	8			100			
CAS_5	H60_3	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	8			100			
CAS_6	H60_3	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	8			100			
CAS_7	H60_3	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	8			100			
CAS_8	H60_3	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	8			100			
CAS_9	H60_3	UH60A	65	LFO LOAD 70 KTS	70	KNOTS	daytime	8			100			
CSAR	H60_1	UH60A	80	LFO LOAD 70 KTS	70	KNOTS	daytime	2		100				
STRFFIRE	STRFIRE	20MMGU	650	CRUISE POWER	70	% RPM	daytime	21				100		

Table A-8 Bravo 20 Modeled Profiles and Operations for Baseline (CY2010)

Airspace ID	Mission ID	Aircraft ID	Speed (KIAS)	Power Description	Power Setting	Units	Period of Day	Busy month Ops	Minutes per sortie	Altitude Range (ft)											
										100 300	300 301	500 3k	1000 1001	3k 7k	500 11k	5k 14k	5k 25k	7k 15k	9k 25k	11k 18k	18k 40k
F5	F5_BFM	F-5E	350	CRUISE POWER	90	% RPM	daytime	23	30						5					60	35
F5	F5_BFM	F-5E	350	CRUISE POWER	90	% RPM	nighttime	0	30						5					60	35
F5	F5_ADV	F-5E	350	CRUISE POWER	90	% RPM	daytime	47	20							100					
F5	F5_ADV	F-5E	350	CRUISE POWER	90	% RPM	nighttime	1	20							100					
F5	F5_RAMA	F-5E	350	CRUISE POWER	90	% RPM	daytime	14	15						5					60	35
F5	F5_RAMA	F-5E	350	CRUISE POWER	90	% RPM	nighttime	0	15						5					60	35
F5	F5_RAMB	F-5E	350	CRUISE POWER	90	% RPM	daytime	14	15						5					60	35
F5	F5_RAMB	F-5E	350	CRUISE POWER	90	% RPM	nighttime	0	15						5					60	35
F5	F5_PMCF	F-5E	350	TAKEOFF POWER	101	% RPM	daytime	9	20								100				
F5	F5_PMCF	F-5E	350	TAKEOFF POWER	101	% RPM	nighttime	0	20								100				
BFM	F18_BFM	F-18E/F	300	AFTERBURNER POWER	97	% N2	daytime	62	30										100		
BFM	F18_BFM	F-18E/F	300	AFTERBURNER POWER	97	% N2	nighttime	1	30										100		
BFM	F18E_BFM	F-18	300	AFTERBURNER POWER	96.7	% NC	daytime	54	30										100		
BFM	F18E_BFM	F-18	300	AFTERBURNER POWER	96.7	% NC	nighttime	1	30										100		
BFM	F16_BFM	F-16(G100)	300	AFTERBURNER POWER	105	% NC	daytime	17	30										100		
BFM	F16_BFM	F-16(G100)	300	AFTERBURNER POWER	105	% NC	nighttime	0	30										100		
FRS	F18_FRS	F-18E/F	350	TAKEOFF POWER	96	% N2	daytime	247	20			50		45				5			
FRS	F18_FRS	F-18E/F	350	TAKEOFF POWER	96	% N2	nighttime	3	20			50		45				5			
FRS	F18E_FRS	F-18	500	TRAINING ROUTE	92	% NC	daytime	214	20			50		45				5			
FRS	F18E_FRS	F-18	500	TRAINING ROUTE	92	% NC	nighttime	2	20			50		45				5			
FRS	F16_FRS	F-16(G100)	350	TAKEOFF POWER	104	% NC	daytime	68	20			50		45				5			
FRS	F16_FRS	F-16(G100)	350	TAKEOFF POWER	104	% NC	nighttime	1	20			50		45				5			
H1	H60_DM1	UH60A	95	LFO LOAD 100 KTS	100	KNOTS	daytime	3	18	100											
H1	H60_SW1	UH60A	90	LFO LOAD 100 KTS	100	KNOTS	daytime	3	18		100										
H2	H60_DM1	UH60A	95	LFO LOAD 100 KTS	100	KNOTS	daytime	7	18	100											
H2	H60_SW1	UH60A	90	LFO LOAD 100 KTS	100	KNOTS	daytime	7	18		100										
H3	H60_DM2	UH60A	40	TKF LOAD 0 KTS	40	KNOTS	daytime	11	36	100											
H3	H60_SW2	UH60A	40	TKF LOAD 0 KTS	40	KNOTS	daytime	11	36		100										
H5	H60_DM1	UH60A	95	LFO LOAD 100 KTS	100	KNOTS	daytime	7	36	100											
H5	H60_SW1	UH60A	90	LFO LOAD 100 KTS	100	KNOTS	daytime	7	36		100										
SSTRA	F18_STR	F-18E/F	400	MID SPD TRAINING RT	84.5	% N2	daytime	463					100								
SSTRA	F18_STR	F-18E/F	400	MID SPD TRAINING RT	84.5	% N2	nighttime	5					100								
SSTRA	F18E_STR	F-18E/F	400	MID SPD TRAINING RT	84.5	% N2	daytime	402					100								
SSTRA	F18E_STR	F-18E/F	400	MID SPD TRAINING RT	84.5	% N2	nighttime	4					100								
SSTRA	F16_STR	F-16(G100)	425	MAX ENDURANCE	85	% NC	daytime	127					100								
SSTRA	F16_STR	F-16(G100)	425	MAX ENDURANCE	85	% NC	nighttime	1					100								
STRAFIRE	STRFIRE	20MMGU	650	CRUISE POWER	70	% RPM	daytime	992					100								
STRAFIRE	STRFIRE	20MMGU	650	CRUISE POWER	70	% RPM	nighttime	10					100								
SCONV	F18_CON	F-18E/F	400	MID SPD TRAINING RT	84.5	% N2	daytime	463					100								
SCONV	F18_CON	F-18E/F	400	MID SPD TRAINING RT	84.5	% N2	nighttime	5					100								
SCONV	F18E_CON	F-18E/F	400	MID SPD TRAINING RT	84.5	% N2	daytime	402					100								
SCONV	F18E_CON	F-18E/F	400	MID SPD TRAINING RT	84.5	% N2	nighttime	4					100								
SCONV	F16_CON	F-16(G100)	465	LOW SPD TRAINING RT	94	% NC	daytime	127					100								
SCONV	F16_CON	F-16(G100)	465	LOW SPD TRAINING RT	94	% NC	nighttime	1					100								
H4	H60_DM1	UH60A	95	LFO LOAD 100 KTS	100	KNOTS	daytime	11		100											
H4	H60_SW1	UH60A	90	LFO LOAD 100 KTS	100	KNOTS	daytime	11			100										

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Table A-9 Bravo 20 Modeled Profiles and Operations for Prospective (CY2015)

Airspace ID	Mission ID	Aircraft ID	Speed (KIAS)	Power Description	Power Setting	Units	Period of Day	Busy month Ops	Minutes per sortie	Altitude Range (ft)											
										100-300	300-301	500-3k	1000-1001	3k-7k	500-11k	5k-14k	5k-25k	7k-15k	9k-25k	11k-18k	18k-40k
F5	F5_BFM	F-5E	350	CRUISE POWER	90	% RPM	daytime	26	30						5					60	35
F5	F5_BFM	F-5E	350	CRUISE POWER	90	% RPM	nighttime	0	30						5					60	35
F5	F5_ADV	F-5E	350	CRUISE POWER	90	% RPM	daytime	51	20							100					
F5	F5_ADV	F-5E	350	CRUISE POWER	90	% RPM	nighttime	1	20							100					
F5	F5_RAMA	F-5E	350	CRUISE POWER	90	% RPM	daytime	15	15						5					60	35
F5	F5_RAMA	F-5E	350	CRUISE POWER	90	% RPM	nighttime	0	15						5					60	35
F5	F5_RAMB	F-5E	350	CRUISE POWER	90	% RPM	daytime	15	15						5					60	35
F5	F5_RAMB	F-5E	350	CRUISE POWER	90	% RPM	nighttime	0	15						5					60	35
F5	F5_PMCF	F-5E	350	TAKEOFF POWER	101	% RPM	daytime	10	20								100				
F5	F5_PMCF	F-5E	350	TAKEOFF POWER	101	% RPM	nighttime	0	20								100				
BFM	F18_BFM	F-18E/F	300	AFTERBURNER POWER	97	% N2	daytime	57	30										100		
BFM	F18_BFM	F-18E/F	300	AFTERBURNER POWER	97	% N2	nighttime	1	30										100		
BFM	F18E_BFM	F-18	300	AFTERBURNER POWER	97	% NC	daytime	70	30										100		
BFM	F18E_BFM	F-18	300	AFTERBURNER POWER	97	% NC	nighttime	1	30										100		
BFM	F16_BFM	F-16(G100)	300	AFTERBURNER POWER	105	% NC	daytime	19	30										100		
BFM	F16_BFM	F-16(G100)	300	AFTERBURNER POWER	105	% NC	nighttime	0	30										100		
FRS	F18_FRS	F-18E/F	350	TAKEOFF POWER	96	% N2	daytime	229	20			50		45				5			
FRS	F18_FRS	F-18E/F	350	TAKEOFF POWER	96	% N2	nighttime	2	20			50		45				5			
FRS	F18E_FRS	F-18	500	TRAINING ROUTE	92	% NC	daytime	279	20			50		45				5			
FRS	F18E_FRS	F-18	500	TRAINING ROUTE	92	% NC	nighttime	3	20			50		45				5			
FRS	F16_FRS	F-16(G100)	350	TAKEOFF POWER	104	% NC	daytime	74	20			50		45				5			
FRS	F16_FRS	F-16(G100)	350	TAKEOFF POWER	104	% NC	nighttime	1	20			50		45				5			
H1	H60_DM1	UH60A	95	LFO LOAD 100 KTS	100	KNOTS	daytime	3	18	100											
H1	H60_SW1	UH60A	90	LFO LOAD 100 KTS	100	KNOTS	daytime	3	18		100										
H2	H60_DM1	UH60A	95	LFO LOAD 100 KTS	100	KNOTS	daytime	8	18	100											
H2	H60_SW1	UH60A	90	LFO LOAD 100 KTS	100	KNOTS	daytime	8	18		100										
H3	H60_DM2	UH60A	40	TKF LOAD 0 KTS	40	KNOTS	daytime	12	36	100											
H3	H60_SW2	UH60A	40	TKF LOAD 0 KTS	40	KNOTS	daytime	12	36		100										
H5	H60_DM1	UH60A	95	LFO LOAD 100 KTS	100	KNOTS	daytime	8	36	100											
H5	H60_SW1	UH60A	90	LFO LOAD 100 KTS	100	KNOTS	daytime	8	36		100										
SSTRA	F18_STR	F-18E/F	400	MID SPD TRAINING RT	85	% N2	daytime	429					100								
SSTRA	F18_STR	F-18E/F	400	MID SPD TRAINING RT	85	% N2	nighttime	4					100								
SSTRA	F18E_STR	F-18E/F	400	MID SPD TRAINING RT	85	% N2	daytime	524					100								
SSTRA	F18E_STR	F-18E/F	400	MID SPD TRAINING RT	85	% N2	nighttime	5					100								
SSTRA	F16_STR	F-16(G100)	425	MAX ENDURANCE	85	% NC	daytime	139					100								
SSTRA	F16_STR	F-16(G100)	425	MAX ENDURANCE	85	% NC	nighttime	1					100								
STRAFIRE	STRFIRE	20MMGU	650	CRUISE POWER	70	% RPM	daytime	1,092					100								
STRAFIRE	STRFIRE	20MMGU	650	CRUISE POWER	70	% RPM	nighttime	11					100								
SCONV	F18_CON	F-18E/F	400	MID SPD TRAINING RT	85	% N2	daytime	429					100								
SCONV	F18_CON	F-18E/F	400	MID SPD TRAINING RT	85	% N2	nighttime	4					100								
SCONV	F18E_CON	F-18E/F	400	MID SPD TRAINING RT	85	% N2	daytime	524					100								
SCONV	F18E_CON	F-18E/F	400	MID SPD TRAINING RT	85	% N2	nighttime	5					100								
SCONV	F16_CON	F-16(G100)	465	LOW SPD TRAINING RT	94	% NC	daytime	139					100								
SCONV	F16_CON	F-16(G100)	465	LOW SPD TRAINING RT	94	% NC	nighttime	1					100								
H4	H60_DM1	UH60A	95	LFO LOAD 100 KTS	100	KNOTS	daytime	12		100											
H4	H60_SW1	UH60A	90	LFO LOAD 100 KTS	100	KNOTS	daytime	12			100										

Table A-10 Modeled Profiles and Sorties for Adversary Exercises for Baseline (CY2010)

(a) Top Gun Profiles

Airspace ID	Mission ID	Aircraft ID	Speed (KIAS)	Power Description	Power Setting	Units	Period of Day	Busy month Sorties	Minutes per sortie	Altitude Range (ft)			
										30k-50k	500-3k	3k-15k	15k-30k
BANDIT	F5HOLD	F-5E	350	CRUISE POWER	90%	RPM	daytime	230	20	30	10	30	30
BANDIT	F5HOLD	F-5E	350	CRUISE POWER	90%	RPM	nighttime	41	20	30	10	30	30
DIAMOND	F18HOLD	F-18	350	CRUISE POWER	90%	NC	daytime	126	20	30	10	30	30
DIAMOND	F18HOLD	F-18	350	CRUISE POWER	90%	NC	nighttime	22	20	30	10	30	30
DIAMOND	F18EHOLD	F-18E/F	350	TAKEOFF POWER	90%	N2	daytime	103	20	30	10	30	30
DIAMOND	F18EHOLD	F-18E/F	350	TAKEOFF POWER	90%	N2	nighttime	18	20	30	10	30	30
END	F18FGT	F-18	350	CRUISE POWER	90%	NC	daytime	126	10	25	25	25	25
END	F18FGT	F-18	350	CRUISE POWER	90%	NC	nighttime	22	10	25	25	25	25
END	F18EFGT	F-18E/F	350	TAKEOFF POWER	90%	N2	daytime	103	10	25	25	25	25
END	F18EFGT	F-18E/F	350	TAKEOFF POWER	90%	N2	nighttime	18	10	25	25	25	25
END	F5FGT	F-5E	350	CRUISE POWER	90%	RPM	daytime	230	10	25	25	25	25
END	F5FGT	F-5E	350	CRUISE POWER	90%	RPM	nighttime	41	10	25	25	25	25
FIGHT	F18FGT	F-18	350	CRUISE POWER	90%	NC	daytime	126	90	25	25	25	25
FIGHT	F18FGT	F-18	350	CRUISE POWER	90%	NC	nighttime	22	90	25	25	25	25
FIGHT	F18EFGT	F-18E/F	350	TAKEOFF POWER	90%	N2	daytime	103	90	25	25	25	25
FIGHT	F18EFGT	F-18E/F	350	TAKEOFF POWER	90%	N2	nighttime	18	90	25	25	25	25
FIGHT	F5FGT	F-5E	350	CRUISE POWER	90%	RPM	daytime	230	90	25	25	25	25
FIGHT	F5FGT	F-5E	350	CRUISE POWER	90%	RPM	nighttime	41	90	25	25	25	25

(b) Air Wing Profiles

Airspace ID	Mission ID	Aircraft ID	Speed (KIAS)	Power Description	Power Setting	Units	Period of Day	Busy month Sorties	Minutes per sortie	Altitude Range (ft)			
										30k-50k	500-3k	3k-15k	15k-30k
BANDIT	F5HOLD	F-5E	350	CRUISE POWER	90%	RPM	daytime	250	20	30	10	30	30
BANDIT	F5HOLD	F-5E	350	CRUISE POWER	90%	RPM	nighttime	44	20	30	10	30	30
DIAMOND	F18HOLD	F-18	350	CRUISE POWER	90%	NC	daytime	185	20	30	10	30	30
DIAMOND	F18HOLD	F-18	350	CRUISE POWER	90%	NC	nighttime	33	20	30	10	30	30
DIAMOND	F18EHOLD	F-18E/F	350	TAKEOFF POWER	90%	N2	daytime	152	20	30	10	30	30
DIAMOND	F18EHOLD	F-18E/F	350	TAKEOFF POWER	90%	N2	nighttime	27	20	30	10	30	30
DIAMOND	EA6HOLD	A-6A	350	TAKEOFF POWER	90%	RPM	daytime	22	20	30	10	30	30
DIAMOND	EA6HOLD	A-6A	350	TAKEOFF POWER	90%	RPM	nighttime	4	20	30	10	30	30
DIAMOND	EA18HOLD	F-18E/F	350	TAKEOFF POWER	90%	N2	daytime	7	20	30	10	30	30
DIAMOND	EA18HOLD	F-18E/F	350	TAKEOFF POWER	90%	N2	nighttime	1	20	30	10	30	30
END	F18END	F-18	500	TRAINING ROUTE	92%	NC	daytime	185	10	16	50	17	17
END	F18END	F-18	500	TRAINING ROUTE	92%	NC	nighttime	33	10	16	50	17	17
END	F18EEND	F-18E&F	500	HIGH SPD TRAINING RT	91%	N2	daytime	152	10	16	50	17	17
END	F18EEND	F-18E&F	500	HIGH SPD TRAINING RT	91%	N2	nighttime	27	10	16	50	17	17
END	F5END	F-5E	500	TAKEOFF POWER	101%	RPM	daytime	250	10	16	50	17	17
END	F5END	F-5E	500	TAKEOFF POWER	101%	RPM	nighttime	44	10	16	50	17	17
END	EA6END	A-6A	450	TAKEOFF POWER	100%	RPM	daytime	22	10	16	50	17	17
END	EA6END	A-6A	450	TAKEOFF POWER	100%	RPM	nighttime	4	10	16	50	17	17
END	EA18END	F-18E&F	500	HIGH SPD TRAINING RT	91%	N2	daytime	7	10	16	50	17	17
END	EA18END	F-18E&F	500	HIGH SPD TRAINING RT	91%	N2	nighttime	1	10	16	50	17	17
FIGHT	F18FGT	F-18	350	CRUISE POWER	90%	NC	daytime	185	90	25	25	25	25
FIGHT	F18FGT	F-18	350	CRUISE POWER	90%	NC	nighttime	33	90	25	25	25	25
FIGHT	F18EFGT	F-18E/F	350	TAKEOFF POWER	90%	N2	daytime	152	90	25	25	25	25
FIGHT	F18EFGT	F-18E/F	350	TAKEOFF POWER	90%	N2	nighttime	27	90	25	25	25	25
FIGHT	F5FGT	F-5E	350	CRUISE POWER	90%	RPM	daytime	250	90	25	25	25	25
FIGHT	F5FGT	F-5E	350	CRUISE POWER	90%	RPM	nighttime	44	90	25	25	25	25
FIGHT	EA6FGT	A-6A	350	TAKEOFF POWER	90%	RPM	daytime	22	90	25	25	25	25
FIGHT	EA6FGT	A-6A	350	TAKEOFF POWER	90%	RPM	nighttime	4	90	25	25	25	25
FIGHT	EA18FGT	F-18E/F	350	TAKEOFF POWER	90%	N2	daytime	7	90	25	25	25	25
FIGHT	EA18FGT	F-18E/F	350	TAKEOFF POWER	90%	N2	nighttime	1	90	25	25	25	25

Table A-11 Modeled Profiles and Sorties for Adversary Exercises for Prospective (CY2015)

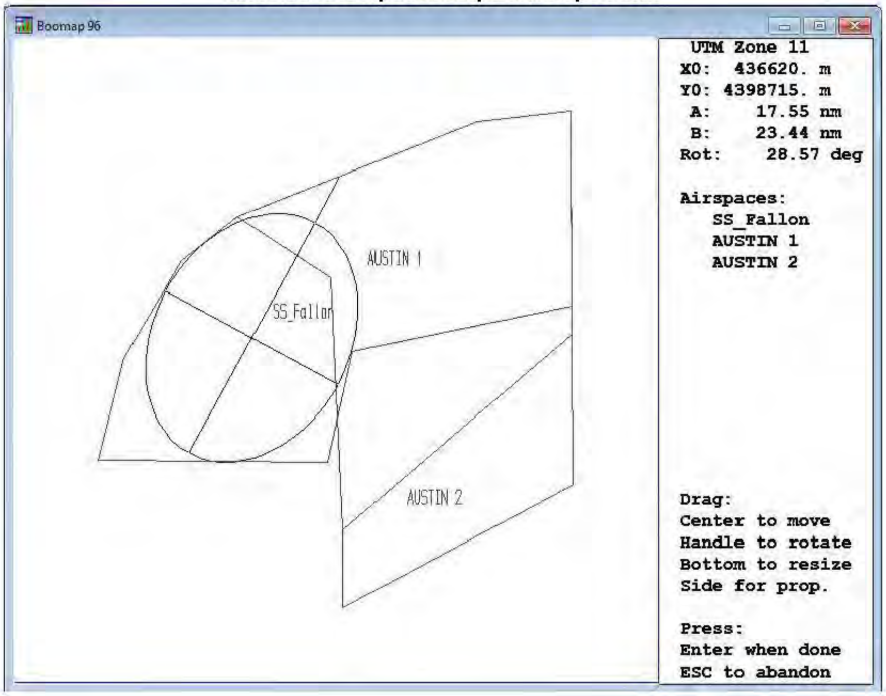
(a) Top Gun Profiles

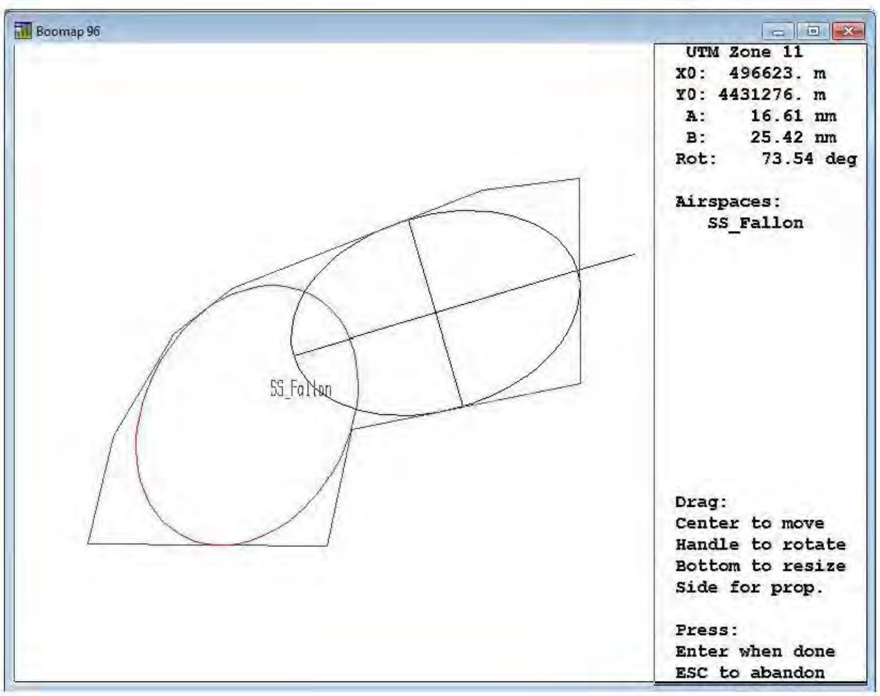
Airspace ID	Mission ID	Aircraft ID	Speed (KIAS)	Power Description	Power Setting	Units	Period of Day	Busy month Sorties	Minutes per sortie	Altitude Range (ft)			
										30k 50k	500 3k	3k 15k	15k 30k
BANDIT	F5HOLD	F-5E	350	CRUISE POWER	90.00%	RPM	daytime	230	20	30	10	30	30
BANDIT	F5HOLD	F-5E	350	CRUISE POWER	90.00%	RPM	nighttime	41	20	30	10	30	30
DIAMOND	F18HOLD	F-18	350	CRUISE POWER	90.00%	NC	daytime	103	20	30	10	30	30
DIAMOND	F18HOLD	F-18	350	CRUISE POWER	90.00%	NC	nighttime	18	20	30	10	30	30
DIAMOND	F18EHOLD	F-18E/F	350	TAKEOFF POWER	90.00%	N2	daytime	126	20	30	10	30	30
DIAMOND	F18EHOLD	F-18E/F	350	TAKEOFF POWER	90.00%	N2	nighttime	22	20	30	10	30	30
END	F18FGT	F-18	350	CRUISE POWER	90.00%	NC	daytime	103	10	25	25	25	25
END	F18FGT	F-18	350	CRUISE POWER	90.00%	NC	nighttime	18	10	25	25	25	25
END	F18EFGT	F-18E/F	350	TAKEOFF POWER	90.00%	N2	daytime	126	10	25	25	25	25
END	F18EFGT	F-18E/F	350	TAKEOFF POWER	90.00%	N2	nighttime	22	10	25	25	25	25
END	F5FGT	F-5E	350	CRUISE POWER	90.00%	RPM	daytime	230	10	25	25	25	25
END	F5FGT	F-5E	350	CRUISE POWER	90.00%	RPM	nighttime	41	10	25	25	25	25
FIGHT	F18FGT	F-18	350	CRUISE POWER	90.00%	NC	daytime	103	90	25	25	25	25
FIGHT	F18FGT	F-18	350	CRUISE POWER	90.00%	NC	nighttime	18	90	25	25	25	25
FIGHT	F18EFGT	F-18E/F	350	TAKEOFF POWER	90.00%	N2	daytime	126	90	25	25	25	25
FIGHT	F18EFGT	F-18E/F	350	TAKEOFF POWER	90.00%	N2	nighttime	22	90	25	25	25	25
FIGHT	F5FGT	F-5E	350	CRUISE POWER	90.00%	RPM	daytime	230	90	25	25	25	25
FIGHT	F5FGT	F-5E	350	CRUISE POWER	90.00%	RPM	nighttime	41	90	25	25	25	25

(b) Air Wing Profiles

Airspace ID	Mission ID	Aircraft ID	Speed (KIAS)	Power Description	Power Setting	Units	Period of Day	Busy month Sorties	Minutes per sortie	Altitude Range (ft)			
										30k 50k	500 3k	3k 15k	15k 30k
BANDIT	F5HOLD	F-5E	350	CRUISE POWER	90.00%	RPM	daytime	250	20	30	10	30	30
BANDIT	F5HOLD	F-5E	350	CRUISE POWER	90.00%	RPM	nighttime	44	20	30	10	30	30
DIAMOND	F18HOLD	F-18	350	CRUISE POWER	90.00%	NC	daytime	152	20	30	10	30	30
DIAMOND	F18HOLD	F-18	350	CRUISE POWER	90.00%	NC	nighttime	27	20	30	10	30	30
DIAMOND	F18EHOLD	F-18E/F	350	TAKEOFF POWER	90.00%	N2	daytime	185	20	30	10	30	30
DIAMOND	F18EHOLD	F-18E/F	350	TAKEOFF POWER	90.00%	N2	nighttime	33	20	30	10	30	30
DIAMOND	EA6HOLD	A-6A	350	TAKEOFF POWER	90.00%	RPM	daytime	3	20	30	10	30	30
DIAMOND	EA6HOLD	A-6A	350	TAKEOFF POWER	90.00%	RPM	nighttime	1	20	30	10	30	30
DIAMOND	EA18HOLD	F-18E/F	350	TAKEOFF POWER	90.00%	N2	daytime	26	20	30	10	30	30
DIAMOND	EA18HOLD	F-18E/F	350	TAKEOFF POWER	90.00%	N2	nighttime	5	20	30	10	30	30
END	F18END	F-18	500	TRAINING ROUTE	92.00%	NC	daytime	152	10	16	50	17	17
END	F18END	F-18	500	TRAINING ROUTE	92.00%	NC	nighttime	27	10	16	50	17	17
END	F18EEND	F-18E&F	500	HIGH SPD TRAINING RT	90.50%	N2	daytime	185	10	16	50	17	17
END	F18EEND	F-18E&F	500	HIGH SPD TRAINING RT	90.50%	N2	nighttime	33	10	16	50	17	17
END	F5END	F-5E	500	TAKEOFF POWER	101.00%	RPM	daytime	250	10	16	50	17	17
END	F5END	F-5E	500	TAKEOFF POWER	101.00%	RPM	nighttime	44	10	16	50	17	17
END	EA6END	A-6A	450	TAKEOFF POWER	100.00%	RPM	daytime	3	10	16	50	17	17
END	EA6END	A-6A	450	TAKEOFF POWER	100.00%	RPM	nighttime	1	10	16	50	17	17
END	EA18END	F-18E&F	500	HIGH SPD TRAINING RT	90.50%	N2	daytime	26	10	16	50	17	17
END	EA18END	F-18E&F	500	HIGH SPD TRAINING RT	90.50%	N2	nighttime	5	10	16	50	17	17
FIGHT	F18FGT	F-18	350	CRUISE POWER	90.00%	NC	daytime	152	90	25	25	25	25
FIGHT	F18FGT	F-18	350	CRUISE POWER	90.00%	NC	nighttime	27	90	25	25	25	25
FIGHT	F18EFGT	F-18E/F	350	TAKEOFF POWER	90.00%	N2	daytime	185	90	25	25	25	25
FIGHT	F18EFGT	F-18E/F	350	TAKEOFF POWER	90.00%	N2	nighttime	33	90	25	25	25	25
FIGHT	F5FGT	F-5E	350	CRUISE POWER	90.00%	RPM	daytime	250	90	25	25	25	25
FIGHT	F5FGT	F-5E	350	CRUISE POWER	90.00%	RPM	nighttime	44	90	25	25	25	25
FIGHT	EA6FGT	A-6A	350	TAKEOFF POWER	90.00%	RPM	daytime	3	90	25	25	25	25
FIGHT	EA6FGT	A-6A	350	TAKEOFF POWER	90.00%	RPM	nighttime	1	90	25	25	25	25
FIGHT	EA18FGT	F-18E/F	350	TAKEOFF POWER	90.00%	N2	daytime	26	90	25	25	25	25
FIGHT	EA18FGT	F-18E/F	350	TAKEOFF POWER	90.00%	N2	nighttime	5	90	25	25	25	25

Modeled Area Inputs for Supersonic Operations





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Appendix F: Public Participation

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APPENDIX F PUBLIC PARTICIPATION

This appendix includes information about the public's participation in the development of the Fallon Range Training Complex (FRTC) Environmental Impact Statement (EIS). This appendix summarizes the public scoping process that began with the publication of the Notice of Intent (NOI) in the *Federal Register* in May 2013. The scoping period allowed a variety of opportunities for the public to comment on the scope of the EIS, and included two public scoping meetings. This appendix also summarizes the public participation in the National Environmental Policy Act (NEPA) process through the publication of the Draft EIS.

F.1 PROJECT WEBSITE

A public website was established specifically for this project (http://www.FRTCEIS.com/) and went active on May 24, 2013. This website address was published in the initial NOI and has subsequently been reprinted in all newspaper advertisements, agency letters, and public postcards for both the NOI to Prepare an EIS and Notice of Availability (NOA) of the Draft EIS. Scoping meeting fact sheets, posters, brochures, and various other materials have been available on the project website throughout the course of the project.

F.2 GENERAL SUMMARY OF THE SCOPING PERIOD

The scoping period for the FRTC EIS began with the publication of a NOI in the Federal Register on May 24, 2013. The scoping period began on this date and concluded on July 8, 2013. The United States (U.S.) Department of the Navy (Navy) held four scoping meetings in Nevada, from June 10 through 13, 2013, for the FRTC EIS. The purpose of the meetings was to actively involve the public and other agencies in identifying the environmental issues to be addressed in the Draft EIS as well as other potential alternatives to accomplish the purpose and need. Efforts to notify the public, media, federally recognized tribes, government agencies, and elected officials about the scoping meetings were conducted in accordance with the Navy's *Public Involvement Plan* for the FRTC EIS.

F.2.1 PUBLIC SCOPING NOTIFICATION

The Navy made significant efforts at notifying the public to ensure maximum public participation during the scoping process. A summary of these efforts follows.

F.2.1.1 Federal Register Notice

On May 24, 2013, the Navy published a NOI/Notice of Public Scoping Meetings in the Federal Register, which announced the intent to prepare a Draft EIS to evaluate potential environmental effects associated with current and proposed military readiness activities at FRTC; the proposed action and alternatives; and the dates, locations, and times of the scoping meetings.

F.2.1.2 Tribal Letters

A personalized tribal notification letter was mailed to eight federally recognized tribes on May 16, 2013. This letter served to inform the tribes that the Navy was preparing an EIS, provide detailed information about the proposed action, and request input regarding concerns or comments.

F.2.1.3 Notification Letters

A personalized agency notification letter was mailed to 109 federal, state, and local elected officials and government agencies on May 23, 2013. This letter provided detailed information about the proposed action, the scoping process and the dates, locations, and times of the scoping meetings. Information for submitting comments was also provided.

F.2.1.4 Advertisements

A project display advertisement was published in three series in the Lahontan Valley News, *Nevada Appeal*, *Reno Gazette-Journal*, and *Battle Mountain Bugle*. As listed in Table F.2-1 below, the first series ran concurrent with availability of the NOI in the Federal Register on May 24, 2013. The series ran for 3 consecutive days in the daily newspapers and for fewer days in the weekly newspapers. The second series of advertisements was published 5–10 days prior to the open house information sessions. The third series was published 3 consecutive days (for weekly papers) prior to the information sessions, with one advertisement appearing on the day of the first information session.

Table F.2-1: Newspaper Display Advertisements Schedule

COVERAGE AREA	NEWSPAPER	DATES OF ADVERTISEMENT
Fallon, Fernley, Lahontan Valley and Highway 54 corridor, NV (Nevada)	*Lahontan Valley News* *(twice-weekly – Wednesday, Friday)*	Friday, May 24, 2013 Wednesday, May 29, 2013 Friday, May 31, 2013 Wednesday, June 5, 2013 Friday, June 7, 2013
Reno, Carson, NV	*Nevada Appeal* *(daily – Tuesday–Sunday)*	Friday, May 24, 2013 Saturday, May 25, 2013 Sunday, May 26, 2013 Wednesday, June 5, 2013 Friday, June 7, 2013 Saturday, June 8, 2013 Sunday, June 9, 2013
Reno, Sparks, Spanish Springs, Fernley, Dayton, Yerington, NV	*Reno Gazette-Journal* *(daily)*	Friday, May 24, 2013 Saturday, May 25, 2013 Sunday, May 26, 2013 Wednesday, June 5, 2013 Saturday, June 8, 2013 Sunday, June 9, 2013 Monday, June 10, 2013
Battle Mountain, NV	*Battle Mountain Bugle* *(weekly – Wednesday)*	Wednesday, May 29, 2013 Wednesday, June 5, 2013

F.2.1.5 Press Releases

Two news releases were distributed by the Naval Air Station (NAS) Fallon Public Affairs Officer to local and regional media outlets. The NOI press release was distributed on May 24, 2013 and announced the intent to prepare an EIS. The Notice of Scoping Meetings press release was distributed on June 11, 2013, and emphasized the scoping process. The NOI and Notice of Scoping Meetings press releases included details on the proposed action, scoping meeting dates, locations, times, and comment information.

F.2.1.6 Postcard Mailer

A postcard mailer announcing the preparation of an EIS, proposed action, comment information, project website, and the scoping meeting dates, locations, and times, was sent out to 143 individuals on the project mailing list on May 23, 2013.

F.2.2 Scoping Meetings

Four public meetings were conducted in an informal open house format where members of the public could arrive at any time during the 2-hour event. There were no formal presentations or oral comment sessions. The locations, dates, and times of the meetings are listed in Table F.2-2.

Table F.2-2: Scoping Meeting Locations

MEETING LOCATION	VENUE	DATE	TIME
Fallon, Nevada (NV)	Churchill County Commission Chambers	June 10, 2013	5 to 7 p.m.
Crescent Valley, NV	Crescent Valley Town Office Boardroom	June 11, 2013	5 to 7 p.m.
Gabbs, NV	Veterans of Foreign Wars Post 3677	June 12, 2013	5 to 7 p.m.
Austin, NV	Emma Nevada Town Hall	June 13, 2013	5 to 7 p.m.

Staffers at the welcome station greeted guests and encouraged meeting attendees to sign in to receive project information and future notifications, and to identify how they learned about the scheduled information session. A fact sheet booklet and comment forms were distributed to attendees, and verbal direction was provided on the format of the meeting and the organization and flow of the poster stations.

The fact sheet booklet included the following topics: (1) an introduction to the Fallon Range Training Complex, (2) military readiness activities at the Fallon Range Training Complex, (3) the Proposed Action and alternatives, (4) environmental resources to be analyzed, (5) natural and cultural resources, (6) public safety and access, and (7) the NEPA process and community involvement.

Poster stations were set up around the room offering visual displays, fact sheet booklets, and comment forms. Posters covered the following topics: (1) welcome and sign-in, (2) importance of the Navy mission and training at the Fallon Range Training Complex, (3) Study Area, (4) Proposed Action and alternatives, (5) environmental resources to be analyzed, (6) cultural resources, (7) natural resources, (8) public safety and access, and (9) NEPA process and community involvement. Navy and contractor subject matter experts staffed each poster station to answer questions and provide project information.

A comment station, which included tables, chairs, pens, comment forms, and a digital voice recorder for oral comments, was also provided to facilitate the submission of public comments. Attendees were encouraged to provide comments for consideration in the development of the Draft EIS. Individuals could submit comments at the meetings, mail them to the address provided, or submit them online at www.FRTCEIS.com.

F.2.2.1 Attendance

Guests were encouraged to sign in at the welcome table. The information below reflects the number of guests who chose to sign in at the welcome table. Media attendance reflects the number of persons who identified themselves as media. In total, 34 people signed in at the welcome table.

- Eight (8) people signed the attendance sheet at the Fallon meeting. Federal, local, and tribal government representation included: Fallon Paiute-Shoshone Tribe, City of Fallon, Churchill County, and Nevada State Health Division.
- Nine (9) people signed the attendance sheet at the Crescent Valley meeting. Federal, local, and tribal government representation included: Crescent Valley Town Advisory Board and the Eureka County Sheriff's Office.
- Eleven (11) people signed the attendance sheet at the Gabbs meeting. There was no Federal, local, or tribal government representation at this meeting.
- Six (6) people signed the attendance sheet at the Austin meeting. Federal, local, and tribal government representation included the Austin County Commission.

F.2.2.2 Public Scoping Comments

During the FRTC scoping period, public and agency comments were submitted via mail, website, and e-mail. A total of eight (8) written comments were received during the public comment period from May 24, 2013 through July 8, 2013. Four (4) written comments were submitted at the information sessions, one (1) comment was submitted via the project website, two (2) comments were submitted via e-mail, and one (1) comment was submitted by mail.

Issues and questions submitted at the information sessions or during the comment period (not prioritized) include:

- Noise
- Sonic booms
- Notification of activities, including supersonic areas
- General support for the proposed action
- Flood water mitigation
- Unmanned Autonomous Systems
- Sage grouse and impacts of sonic booms

F.3 Public Comment Period for the Draft Environmental Impact Statement

The 45day public comment period on the Draft EIS began with the issuance of the NOA and a Notice of Public Meetings (NOPM) in the Federal Register on January 23, 2015 (Appendix A; Federal Register Notices) and concluded on March 9, 2015. The Navy made every effort to notify the public to ensure maximum public participation during the public comment period, including using letters to local, state, tribal, and federal officials and agencies, postcards, press releases, and newspaper display advertisements.

F.3.1 Federal Register Notice

On Friday, January 23, 2015, the Navy published an NOPM for the Draft EIS for FRTC in the Federal Register, which announced the availability of the Draft EIS for public review and comment, and the date, location, and time of the public meeting.

F.3.2 TRIBAL LETTERS

A personalized tribal notification letter was mailed to 11 federally recognized tribes, including the Walker River Paiute Tribe of the Walker Indian Reservation on January 20, 2015. This letter served to formally notify the Tribes of the preparation and availability of the Draft EIS for review. Follow-up phone calls were made to ensure the letters were received and were sent to the correct personnel within each tribe.

F.3.3 NOTIFICATION LETTERS

A personalized agency notification letter was mailed to 121 federal, state, and local elected officials and government agencies on January 20, 2015. This letter provided detailed information about the proposed action, the public review and comment process, and the date, location, and time of the public meeting. Information for submitting comments was also provided.

F.3.4 ADVERTISEMENTS

Display advertisements were placed in the following four newspapers: *Lahontan Valley News, Nevada Appeal, Reno Gazette-Journal, and the Battle Mountain Bugle*. As listed below, the newspaper advertisements occurred after the NOA/NOPM was published in the Federal Register.

Lahontan Valley News
Friday, January 23, 2015
Wednesday, January 28, 2015
Friday, January 30, 2015
Wednesday, February 4, 2015
Friday, February 6, 2015
Wednesday, February 11, 2015
Friday, February 13, 2015
Wednesday, February 18, 2015

Nevada Appeal
Friday, January 23, 2015
Saturday, January 24, 2015
Sunday, January 25, 2015
Wednesday, February 11, 2015
Thursday, February 12, 2015
Tuesday, February 17, 2015
Wednesday, February 18, 2015
Thursday February 19, 2015

Reno Gazette-Journal
Friday, January 23, 2015
Saturday, January 24, 2015
Sunday, January 25, 2015

Wednesday, February 11, 2015
Tuesday, February 17, 2015
Wednesday, February 18, 2015
Thursday February 19, 2015

Battle Mountain Bugle
Wednesday, January 28, 2015
Wednesday, February 11, 2015
Wednesday, February 18, 2015

F.3.5 PRESS RELEASES

A press release was distributed by Commander, Navy Region Southwest Public Affairs Officer to media outlets, elected officials and other potentially interested parties. The NOPM press release was distributed on January 23, 2015, and announced the availability of the Draft EIS for review and comment. The press release included details on the proposed action, meeting dates, locations, times, and comment information.

F.3.6 PUBLIC SERVICE ANNOUNCEMENT

A public service announcement was distributed by the Commander, Navy Region Southwest Public Affairs Officer to media outlets, elected officials, and other potentially interested parties. The public service announcement announced the public meeting dates, locations, and times.

F.3.7 POSTCARD MAILER

A postcard mailer announcing the preparation of an EIS, proposed action, comment information, project website, and the public meeting date, location, and time, was sent out to individuals on the project mailing list on January 20, 2015.

F.3.8 FLIER

A flier providing the date, location, and time of the public meeting, along with the project website was provided to distribution locations in Fallon, Austin, Crescent City, and Gabbs, Nevada, and included libraries, post offices, chambers of commerce, and local markets. The fliers were distributed on February 12, 2015.

F.3.9 PUBLIC MEETINGS

One public meeting was held on February 19, 2015, from 5 to 7 p.m. at the Churchill County Commission Chambers. The public meeting consisted of an open house session with information poster stations staffed by Navy representatives and a Navy presentation that was conducted at 5:30 p.m. There was no formal oral comment session, but a comment station, which included tables, chairs, pens, and comment forms, was provided to facilitate the submission of written public comments. A certified court reporter was available for the duration of the meeting to record oral public comments. No media attended the meeting. Meeting attendees were also advised that they could submit comments online via the project website, http://www.frtceis.com/.

F.3.10 ATTENDANCE

Guests were encouraged to sign in at the welcome table. The information below reflects the number of guests who chose to sign in at the welcome table. In total, nine people signed in at the welcome table; elected official representation included a staff member from the Churchill County Commissioner’s office, officials from the Bureau of Land Management, Churchill County Manager’s Office, Churchill County Planning Department, and Eureka County; other representation included individuals from the Churchill County Farm Bureau and the National Pony Express, Nevada Division.

F.3.11 DRAFT ENVIRONMENTAL IMPACT STATEMENT PUBLIC COMMENTS

During the FRTC Draft EIS public comment period, public, tribal, and agency comments were submitted via mail, website, and e-mail. During the public comment period, comments were received from three federal agencies, four state/local/regional agencies, one tribe, and three private individuals. Commenters provided their input on the Draft EIS in letters submitted through mail, written, or oral comments received at the public meetings, and via the project web site.

Comments addressed various resource areas, from off-range ordnance concerns to climate change and training operations (Table F.3-1).

Table F.3-1: Fallon Range Training Complex Draft EIS Comments

Resource Issues	Comments	Percentage
Off-range Ordnance	8	15%
Soil Contamination	6	11%
Noise	5	9%
Tribal Consultation / Native American Lands	5	9%
Cultural Resources / Pony Express / SHPO	5	9%
Air Quality / Climate Change	5	6%
Transportation	3	6%
NEPA / Public Outreach	3	4%
Land Use	2	4%
Munition Constituent Migration	2	4%
Socioeconomic Effects	2	2%
Threatened and Endangered Species	2	2%
Water Pollution Control Permitting	2	2%
Maps	1	9%
Military Munitions Rule	1	9%
Training Operations	1	4%
ISSUE TOTALS	**53**	**100.00%**

Notes: The number of comments for each resource area will not add to the total number of comments received. Many letters had several comments or one comment could span across several issues. This table only includes a tally of written comments that were received via mail, website and e-mail throughout the scoping process.

Table F.3-2 through Table F.3-4 provide a listing of all comments received on the Draft EIS and the Navy's response. Each row in these tables presents the identification of the commenter, the comment, and the Navy's response to the comment. Because many commenters touched on more than one topic, the commenter's topics were separated into individual comments, assigned a number, and responded to separately. The commenter's name is abbreviated when the comment is broken into more than one topic. The comment numbering system also captures whether the comment was received electronically via www.frtceis.com or a computer at one of the public meetings, in written form by mail or during a public meeting, or orally during public testimony at a public meeting. For example, the second of the agency comments is by the United States Department of the Interior, Office of Environmental Policy and Compliance. Since their comments cover several topics, these are separated into subsequent comments named DOI-02, DOI-03, etc.

Responses to all comments were prepared and reviewed for scientific and technical accuracy and completeness. Comments appear as they were submitted and have not been altered with the exception that expletives and personal information were removed, as necessary.

Table F.3-2 contains comments from federal, state, and local agencies received during the public comment period and the Navy's response.

Table F.3-2: Responses to Comments from Agencies

Commenter	Comment	Navy Response
Mark Kautsky Department of Energy Office of Legacy Management	The U.S. Department of Energy (DOE) Office of Legacy Management appreciates the opportunity to provide comment on the Environmental Impact Statement (EIS) prepared by the U.S. Department of the Navy. The DOE has responsibility for the subsurface of the Shoal site which is included in the EIS. The Shoal site consists of approximately four square miles (2,560 acres) of withdrawn federal lands that was used for underground nuclear testing. Responsibility for the site is outlined in the Military Land Withdrawals Act of 1999. DOE has no comment on the EIS. DOE would like to ensure long-term protection of Shoal site features (monitoring wells, shaft, tailings, monument, and features of historical significance) and welcomes the opportunity to discuss ways to document the commitment to protect human health and the environment at the site.	Thank you for your participation in the NEPA process. The Navy appreciates your involvement and will continue to work with the Department of Energy to ensure that commitments regarding the Shoal Site are met.
Patricia S. Port Regional Environmental Officer, United States Department of the Interior Office of Environmental Policy and Compliance Pacific Southwest Region (DOI)	Section 3.6 Land Use and Recreation, Page 3.6-2, 3.6.2.3.1 Churchill County, 3rd sentence: The acreage listed for lands under Reclamation's jurisdiction is incorrect. The Lahontan Basin Area Office manages approximately 387,713 acres; of which 381,594 acres are 1st Form withdrawn lands, and 6,120 acres are acquired lands in Churchill County, Nevada. These data are compiled from a July 2014 comprehensive lands review and are available upon request.	The Final EIS includes updated information to reflect the revised acreage provided in the comment.
DOI-2	We are concerned that the Pony Express National Historic Trail (NHT), in particular, could sustain significant adverse impacts from this	Section 3.9 (Cultural Resources) of the Final EIS includes updated information describing historic-trail related

Commenter	Comment	Navy Response
	undertaking, as proposed currently. The Navy's awareness of historic-trail related properties that are listed or eligible for listing on the National Register of Historic Places (NRHP) within the project area appears to be incomplete. The Draft EIS (page 3.9-13) states, "Only two NRHP-listed resources are located near the Supersonic Operating Area B: the Grimes Point Archaeological Area and Hidden Cave, and the Sand Springs Pony Express Station (U.S. Department of the Interior, Bureau of Land Management 2013b)." However, judging from the schematic project map (page 3.9-12), several other historic trail-related properties lie within that Indirect Area of Potential Effect (IAPE). These include the first and second Cold Springs Pony Express Stations, both of which are listed on the NRHP. The second Cold Springs Station, also known as Rock Creek Stage Station, was a stop on the Overland Stage route as well. Associated with these stations and included in their NR listing is an 1861 telegraph repeater and maintenance station that served the transcontinental telegraph: completion of the telegraph rendered the Pony Express obsolete and contributed to its closure. Edwards Creek and Smith Creek Pony Express Stations, both on private lands, also appear to be within the IAPE. New Pass Station, another Overland Stage Station, appears to be within the IAPE as defined on that map, too. The Central Overland route is under study by the National Park Service (NPS), at the direction of Congress, for possible addition to the California National Historic Trail. We further observe that although Sand Springs Station is identified in the Draft EIS as an archeological site, it and the other stations named above also possess sensitive architectural components, mostly but not exclusively consisting of standing walls of dry-laid stone (see Donald Hardesty's 1979 archaeological report, The Pony Express in Central Nevada). Very few buildings or structures associated with the Pony Express, or for that matter with the Central Overland	properties that are listed or eligible for listing on the National Register of Historic Places (NRHP) within the Indirect Area of Potential Effect.

Commenter	Comment	Navy Response
	stagecoach operation, remain as intact as these.	
DOI-3	On page 3.9-21 appears this statement: "Although vibrations from sonic booms have the potential to cause structural instability in sensitive natural features associated with archaeological sites located under the Supersonic Operating Area B (e.g., caves, rockshelters, and rock faces containing petroglyphs and pictographs), procedures are in place for the identification, evaluation, and protection of such resources as defined in the PA (Naval Air Station Fallon et al. 2011)." Similar statements appear elsewhere. Potential to cause structural instability in sensitive cultural features, such as the architectural remains of the Pony Express, telegraph, and stage stations, is not addressed. We recommend that possible impacts to these buildings and structures be clearly identified and evaluated in preparing the Final EIS.	Section 3.9 (Cultural Resources) of the FEIS includes additional analysis of potential impacts on historic-trail related properties that are listed or eligible for listing on the National Register of Historic Places (NRHP) within the Indirect Area of Potential Effect.
DOI-4	The 2011 Programmatic Agreement between Naval Air Station Fallon and the Nevada State Historic Preservation Office (cited in the Draft EIS) is specifically for "the Identification, Evaluation and Treatment of Historic Properties on Lands Managed by Naval Air Station, Fallon." National Register-listed or -eligible properties such as the station sites on BLM, state, or private lands that may be impacted by Navy activities are not specifically covered therein, but are to be addressed "in accordance with the policies and procedures of the Federal agency with control and jurisdiction over the affected lands" (Naval Air Station Fallon et al. 2011:3). As a result, potential effects on the Pony Express NHT properties and the feasibility study route on BLM lands must be given consideration as part of the National Landscape Conservation System and in accordance with BLM Manual 6280. However, the Draft EIS does not address whether this coordination with BLM has occurred nor, if so, what the resulting determinations may be. Moreover, according to the Draft EIS, determinations of	Following publication of the Draft EIS, the Navy completed consultation under Section 106 of the National Historic Preservation Act with the Nevada State Historic Preservation Office and Native American Tribes. In addition, the Navy coordinated with the Bureau of Land Management as a cooperating agency to this EIS. The Nevada State Historic Preservation Office concurred with the Navy's determination of no adverse effect to Historic Properties on August 19, 2015 (see Appendix C of Final EIS).

Commenter	Comment	Navy Response
	effect under §106 of the National Historic Preservation Act are yet to be made “pending consultation with the SHPO [Nevada State Historic Preservation Office] and Native American Tribes.” If consultation with SHPO and the Advisory Council on Historic Preservation is actively underway as a parallel or coordinated process, which is recommended by both Council on Environmental Quality and §106 implementing regulations, then the determinations of effect for these properties should be presented in the Final EIS. If it is not actively underway at this stage in the NEPA process, we recommend that impacts and effects on NHT properties and other cultural resources be fully accounted for early in preparing the administrative draft Final EIS. Since §106 compliance does not appear to be integrated into or adequately explained by this Draft EIS, reviewers with concerns about cultural resources are at a loss to know whether the process has been initiated, how far along it might be, whether and how historic properties may be adversely affected, whether a treatment plan is to be developed, and what interested parties may have been invited to participate in that process. If determinations of adverse effect to historic trail properties eventually are made, the NPS requests opportunity to participate in the §106 and treatment plan development processes as an interested organization.	

Commenter	Comment	Navy Response
DOI-5	To summarize, it is uncertain whether adverse impacts/effects to historic trail-related properties will inevitably result from implementing the Navy's preferred alternative. However, the Draft EIS does state that significant impacts to those properties could occur "if unresolved by the Section 106 process". In preparing the Final EIS, it is recommended that all potentially affected NHT-related historic properties within or near the boundaries of the IAPE be identified; that potential impacts to them be systematically addressed; that affected agencies and the interested public be fully informed of any adverse impacts under the National Environmental Policy Act and adverse effects under the National Historic Preservation Act; and that interested parties, including the NPS, be given opportunity to participate in the §106 process. Again, we appreciate this opportunity to review the Draft EIS prepared for this proposed undertaking. If the NPS can assist by providing GIS shape files or other information related to NHT resources, please contact Lee Kreutzer, Archeologist/Cultural Resources Specialist, National Trails Intermountain Region, at (801) 741-1012 ext. 118 or at lee_kreutzer@nps.gov. Thank you for the opportunity to review this project. Sincerely, Patricia Sanderson Port	Section 3.9 (Cultural Resources) of the Final EIS includes additional analysis to address potential impacts on historic-trail related properties that are listed or eligible for listing on the National Register of Historic Places (NRHP) within the Indirect Area of Potential Effect. Following publication of the Draft EIS, the Navy completed consultation under Section 106 of the National Historic Preservation Act with the Nevada State Historic Preservation Office and Native American Tribes. In addition, the Navy coordinated with the Bureau of Land Management as a cooperating agency to this EIS. The Nevada State Historic Preservation Office concurred with the Navy's determination of no adverse effect to Historic Properties on August 19, 2015 (see Appendix C of Final EIS).
Lisa Hanf, Assistant Director, Strategic Planning Branch Environmental Protection Agency, Region IX (EPA-1)	Based on our review, we have rated the Preferred Alternative 2 as Environmental Objections – Insufficient Information (EO-2) (see enclosed "Summary of Rating Definitions"). Our objections are based on potential impacts from unexploded ordnance (UXO) and off-range munitions contamination on the Walker River Tribal Reservation, which is adjacent to bombing range B-19, and the lack of information regarding mitigation and range clearance. If not promptly retrieved, UXO and munitions that land off-range are considered wastes under the Resource Conservation and Recovery Act (RCRA) and, according	For a detailed response regarding Tribal Consultation/Impacts from Munitions and Unexploded Ordnance to the Walker River Paiute Reservation, please refer to the response in EPA-5 and EPA-7, which presents the background on off-range munitions as well as procedures employed (both past and present) to reduce or eliminate off-range munitions and the revisions being made to the Final EIS as a result of your comments. The detailed response in EPA-5 also discusses the MOU with the Walker River Paiute Tribe expired in May 2012. The Tribe

Commenter	Comment	Navy Response
	to the DEIS, it is Department of Defense policy to comply with the Military Munitions Rule of RCRA. There is no indication in the DEIS that such retrieval is occurring, since the Memorandum of Understanding with the Tribe to address this issue has expired and no discussion of range clearance on tribal land is included in the DEIS or the Operational Range Clearance Plan. Instead, the DEIS states that munitions expenditures at B-19 range do not appear to result in off-range migration of munitions constituents, despite the history of recovery of significant live and inert ordnance on the Reservation.	and the Navy held a meeting on June 1, 2015 to discuss the MOU and other topics. Until a new MOU is signed, the Navy intends to follow the May 2007 MOU.
EPA-2	We also have concerns regarding the completeness and accuracy of the noise impact analysis, since the Naval Air Station Fallon airfield operations for aircraft utilizing the range were segmented into a separate Environmental Assessment and the noise impacts of those operations were not included in the cumulative impact analysis for this Fallon Range EIS. We raised these issues of scope and cumulative impacts in both our scoping comments for this EIS and our comments on the Draft EA for airfield operations. Finally, we have concerns regarding the sufficiency of the sampling design for characterizing contamination from munitions constituents on the bombing ranges, and the conclusions regarding the potential for off-site contaminant migration.	The detailed response in EPA-14 discusses the noise analysis in the Draft EIS, potential segmentation, and the cumulative noise analysis. EPA-14 also presents the changes that have been made in the Final EIS as a result of your comments. Detailed responses regarding contamination from munitions and potential for off-site migration are presented in EPA-16 through EPA-20.
EPA-3	Tribal Consultation / Impacts from Munitions and Unexploded Ordnance to the Walker River Indian Reservation The Bravo-19 (B-19) range is adjacent to the Walker River Indian Reservation on its southern border and there is a history of munitions landing on the Reservation.	The legacy issue of inadvertent release of munitions on the Walker River Paiute Reservation became apparent in February 1989. The Navy implemented operational changes in November 1989 to reduce or eliminate subsequent off-range munitions, including reorienting strafing/bomb run-in lines and increasing surveillance of all drops. These operational changes have been effective based on Naval Aviation Warfighting Development Center (NAWDC) Range Office data, which show no incidents of off-range munitions at B-19 from 2001 through present (September 2015). In addition to the operational changes, the Navy conducted

Commenter	Comment	Navy Response
		unexploded ordnance (UXO) survey and clearance on affected portions of the Reservation in 1989–1990 and 1998–1999. The Tribe and Navy have considered several alternatives to bring closure to the legacy issue, but have not yet reached a final resolution. Resolution of the legacy off-range munitions issue will continue to be addressed with the Walker River Paiute Tribe and is not considered further in this EIS.
EPA-4	The DEIS references a Memorandum of Agreement with the Walker River Paiute Tribe that the Navy signed in 2005 for the safe removal of munitions found on tribal lands (p. 3.9-16), but nothing more is mentioned on the issue. We requested and received a copy of the MOU from the Navy. It is not clear whether the Navy regularly conducts range cleaning operations on the Reservation or whether the MOU is still in effect, since it appears to have expired in 2012. The Tribe's website indicates that the problem of unexploded ordnance on the Reservation poses a legal and technical burden for the Tribe and they believe that it poses a serious safety hazard to anyone who may venture into this area, which has no warning signs or fencing. The expired MOU included intentions to meet with the Tribe twice a year to foster better communications, and once a year to conduct a safety demonstration for the Tribe regarding the identification and procedures to take when Tribal members come in contact with military or non-military ordnance. The range clearance commitments made by the Navy in the MOU are important for addressing safety concerns, especially with the increased training under the proposed action.	The Walker River Paiute Tribe and Navy signed a Memorandum of Understanding (MOU) on May 14, 2007. This MOU entered into for the purpose of establishing a reporting and assistance process for the Navy to follow in the event that: (1) off-range munitions, flares, or other military munitions land on the Walker River Paiute Reservation; (2) a hazardous material incident occurs that poses a health or safety risk to the Tribe; (3) an aircraft mishap occurs on or adjacent to the Reservation; (4) a military training activity poses a potential or perceived danger to the health, safety, or economic well being of the Tribe. The MOU delineated certain communication/reporting requirements and established emergency entry and assistance procedures that allowed NAS Fallon personnel to enter the Reservation in certain circumstances to assess and address impacts or hazards resulting from military training. The MOU did not address actions related to previous instances of off-range munitions (i.e., the legacy issue of inadvertent release of munitions on the Reservation, which became apparent in February 1989). The MOU expired in May 2012. The Navy intends to follow the May 2007 MOU as much as possible until an updated MOU or other agreements with the Tribe are in place. The Tribe and the Navy held a meeting on June 1, 2015, to discuss the EIS and other topics. Follow-up communications have occurred since the meeting. The Navy initiated Government-to-

Commenter	Comment	Navy Response
		Government contact with the Tribe in April 2015 to formalize an agreement to enhance communications and foster a long-term working relationship on items of mutual interest.
EPA-5	All munitions that land off-range that are not promptly retrieved would be considered to be a solid or hazardous waste under EPA's 1997 Military Munitions Rule (40 CFR Parts 260-266, and Part 270 of the Resource Conservation and Recovery Act, in particular Section 266.202(d)). The DEIS states that it is Department of Defense policy to implement the Military Munitions Rule (p. 3.1-1), yet there is no substantive discussion of this issue.	Very infrequently, munitions are dropped and by accidental miss or skip/bounce can land beyond the range boundary. The Navy complies with the Military Munitions Rule at FRTC by implementing Navy policies and procedures. Per Navy policy, the release of any air-to-surface weapons or stores must be accomplished within Restricted Airspace and must impact on Navy land. As required by the Navy Military Munitions Rule Implementation Policy (July 1998), a munition that may land off-range inadvertently would be retrieved as soon as possible following notification that it has landed off range. Section 4.7.2 (General Air-to-Surface Procedures) of the FRTC Range Operations Manual (NAWDC INST 3752.1H) requires that any no spot, off-target, or off-range munitions or stores be reported to Range Control and a Range Incident Report be prepared. This includes munitions impact location (if known), parameters at release/jettison, and time of incident. In addition, the Navy performs an aerial survey (by helicopter) of the Reservation property boundary on a yearly basis to confirm that no munitions have landed on the Reservation.
EPA-6	It appears that additional UXO and munitions contamination could occur as a result of the increased training scenario under the Preferred Alternative and it is not clear that the Navy is taking responsibility for the existing off-range impacts, since the DEIS states that munitions expenditures at B-19 range do not appear to result in off-range migration of munitions constituents (p.3.7-17, 3.7-19).	The increased training scenario under the Preferred Alternative is not expected to result in additional munitions landing off-range. The probability of munitions landing outside the boundaries of B-19 is very low under the No Action Alternative and Alternatives 1 and 2 (Preferred Alternative) because the Navy implemented operational changes in November 1989 to reduce or eliminate potential for off-range munitions. These measures have been effective based on NAWDC Range Office data, which show no incidents of off-range munitions at B-19 from 2001 through present

Commenter	Comment	Navy Response
		(September 2015). The Navy would also like to clarify any misunderstanding about statements in the Draft EIS regarding "migration of munitions constituents off-range." Conclusions in the Draft EIS indicating no off-range migration of munitions constituents were based on detailed analyses conducted during Range Condition Assessments at FRTC (see Section 3.1.1.2.2.1, Range Sustainability Environmental Program Assessment) and analysis or proposed changes in training activities. This process evaluates the potential for migration of munitions constituents from an operational range to an off-range area, not munitions landing off-range. As explained in response to EPA comment 3, the Navy has taken several steps to address the legacy off-range munitions issue. Resolution of legacy off-range munitions issue will continue to be addressed with the Walker River Paiute Tribe and is not considered further in this EIS.
EPA-7	Tribal consultation with the Walker River Tribe has consisted, thus far, solely of two letters sent to the Tribe – one announcing the scoping period in 2013, and one announcing the availability of the DEIS. Our conversations with the Tribe indicated that they had not been notified that the DEIS was available for public review, and they showed great interest when EPA shared the information. We understand the Navy considers tribal consultation to be ongoing; however, we are concerned that the Navy's efforts, thus far, fell short of ensuring that the Tribe was aware of the public comment period for the DEIS. The public comment period provides an important opportunity for the Tribe to comment publically and be a part of the public record, should they choose to do so.	In accordance with Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, DoD policies, the National Historic Preservation Act, and Navy instructions, Navy engaged in Tribal consultations during scoping, during the public comment period for the Draft EIS, and following release of the Draft EIS (additional written correspondence via Certified Mail, invitations for face-to-face meetings, and follow up phone calls). The Navy is consulting with the following tribes: Battle Mountain Paiute, Duckwater Shoshone, Elko Band, Fallon Paiute-Shoshone, Lovelock Paiute, Pyramid Lake Paiute, South Fork Band, Te-Moak Tribe of Western Shoshone Indians, Walker River Paiute, Winnemucca Paiute, Yerington Paiute, and Yomba Shoshone. In addition the Navy is

Commenter	Comment	Navy Response
		consulting with the Inter-Tribal Council of Nevada. The Walker River Paiute Tribe was the only tribe that accepted the Navy's invitation for a meeting. The meeting was held June 1, 2015, and additional communications have occurred since the meeting. The Navy has initiated Government-to-Government contact to express its desire to pursue a Memorandum of Agreement with the Tribe to enhance communications and foster a long-term working relationship with the Tribe on items of mutual interest.
EPA-8	Recommendations: In the FEIS, provide a discussion of the history of munitions expenditure on the Walker River Reservation. Because the MOU includes a reporting procedure, we assume that data are available on the frequency and extent of aircraft mishaps and of off-range ordnance, flares, or other military munitions landing on Tribal lands. The FEIS should include this information, since it is central to the impact assessment. Disclose whether and, if so, how off- range UXO and munitions on the Walker River Indian Reservation are being managed in compliance with the Military Munitions Rule.	As explained in the response to EPA comments 3 and 4, NAWDC Range Office data indicate that procedures implemented by the Navy in November 1989 to reduce or eliminate off-range munitions at B-19 have been effective and the Proposed Action is not expected to result in munitions landing off-range. This legacy issue has no bearing on the impact analysis; therefore, the history of off-range munitions on the Reservation is not discussed in the Final EIS. Procedures described in response to EPA comment 5 would continue to be followed to prevent and address any off-range munitions under the Proposed Action. Resolution of legacy off-range munitions issues will continue to be addressed with the Walker River Paiute Tribe and is not discussed further in this EIS.
EPA-9	Informed by the above history, revisit the conclusions that munitions expenditures at B-19 range do not appear to result in off-range migration of munitions constituents.	Conclusions in the Draft EIS indicating no off-range migration of munitions constituents were based on detailed analyses conducted during Range Condition Assessments at FRTC (see Section 3.1.1.2.2.1, Range Sustainability Environmental Program Assessment) and analysis of proposed changes in training activities. This process evaluates the potential for migration of munitions constituents from an operational range to an off-range area. The increased training scenario under the

Commenter	Comment	Navy Response
		Preferred Alternative is not expected to result in additional munitions landing off-range. The probability of munitions landing outside the boundaries of B-19 is very low under the No Action Alternative and Alternatives 1 and 2 (Preferred Alternative) because the Navy implemented operational changes in November 1989 to reduce or eliminate potential for off-range munitions. These measures have been effective based on NAWDC Range Office data, which show no incidents of off-range munitions at B-19 from 2001 through present (September 2015). As explained in response to EPA comment 3, the Navy has taken several steps to address the legacy off-range munitions issue. Resolution of legacy off-range munitions issue will continue to be addressed with the Walker River Paiute Tribe and is not considered further in this EIS.
EPA-10	Consider the information and concerns expressed on the Walker River Tribe's website; consult with the Tribe; and adjust, as appropriate, the discussions on environmental justice regarding impacts to the Tribe. Provide an update on the tribal consultation with the Walker River Tribe in the FEIS. Disclose that the referenced MOU is expired and discuss any plans to renegotiate an MOU to address current and future off-range ordnance on Tribal land. Establish a new MOU with the Tribe that reflects the increased risk of off-range munitions that could occur as a result of increased training. We strongly recommend that any such MOU reestablish or enhance the coordination and safety education provisions of the expired MOU.	As explained in response to EPA comment 4, the Navy consulted for the EIS with several Tribes, including the Walker River Paiute Tribe. The Navy initiated Government-to-Government contact in April 2015 with the Walker River Paiute Tribe to express its desire to pursue a Memorandum of Agreement with the Tribe to enhance communications and foster a long-term working relationship with the Tribe on items of mutual interest. Section 3.9 (Cultural Resources) of the Final EIS includes a summary of these consultations.
EPA-11	Explain, in the FEIS, how the Navy is complying, and would comply under the proposed action, with the Military Munitions Rule for munitions that land off-range on the Walker River Indian Reservation.	The Navy complies with the Military Munitions Rule at FRTC by implementing Navy policies and procedures. In accordance with the Navy's Policy to Implement the Military Munitions Rule (MRIP 1998), any off-range munitions are retrieved from the off-range areas as soon as possible following notification that munitions have landed off range. Section 4.7.2 (General

Commenter	Comment	Navy Response
		Air-to-Surface Procedures) of the *FRTC Range Operations Manual* (NAWDC INST 3752.1H) requires that any no spot, off-target, or off-range munitions or stores be reported to Range Control and a Range Incident Report be prepared. This includes munitions impact location (if known), parameters at release/jettison, and time of incident. In addition, the Navy performs an aerial survey (by helicopter) of the Reservation property boundary on an approximately yearly basis to confirm that no munitions have landed on the Reservation. These combined actions ensure that the Navy complies with off-range munitions provisions of the Military Munitions Rule. Section 3.1 (Soils) of the Final EIS includes information about the Military Munitions Rule.
EPA-12	Discuss whether the beneficial procedure outlined in the Native American Lands Environmental Mitigation Program (NALEMP) Implementation Manual is applicable and whether any components of it are being implemented.	The NALEMP procedure involves a direct relationship between the Department of Defense through the Senior Tribal Liaison, the Army Corps of Engineers, and the various tribes. Substantive components of the manual that relate directly to environmental assessment and mitigation are similar to analogous components of the Navy Military Munitions Rule Implementation Policy and of off-range munitions response activities carried out by the Navy under its own authority. As outlined with the NALEMP process, any work on tribal land would involve establishing a direct relationship with the tribe, visiting the site, records search, reviewing historical documents, and interviewing tribal members and knowledgeable military employees. The Navy process, like the NALEMP process, makes protection of human health and safety, as well as health of the environment the goals. Assessing human and environmental health would indirectly address Lifeways and economics, because the analysis would have to specifically consider how the tribe uses the area that is subject to mitigation.

Commenter	Comment	Navy Response
EPA-13	Discuss, in the FEIS, additional mitigation measures that could eliminate or minimize future ordnance and munitions expenditures on the Reservation, such as the possibility of moving the target areas away from the Reservation border, utilizing only inert munitions on Range B-19, as is done with Range B-16, installing warning signs or fencing, or the provision of other benefits to the Tribe, as informed by Tribal consultation.	As explained in response to EPA comment 3, the Navy implemented operational changes at B-19 in November 1989 to reduce or eliminate inadvertent release of munitions on the Walker River Paiute Reservation. These operational changes have been effective based on NAWDC Range Office data, which show no incidents of off-range munitions at B-19 from 2001 through present (September 2015). Therefore, mitigation measures are not needed to eliminate or minimize future off-range munitions on the Reservation.
EPA-14	Noise Impacts and NEPA Segmentation The Navy conducted an Environmental Assessment for the airfield operations at Naval Air Station (NAS) Fallon during the same general time period in which this EIS was being initiated, yet the Navy chose to separate the actions of aircraft takeoff and landings from NAS Fallon with the flight activity of those same planes in the Special Use Airspace (SUA). This could represent improper segmentation. The Council on Environmental Quality (CEQ) NEPA Regulations state that similar actions – those which "when viewed with other reasonably foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography" should be evaluated in the same EIS "when the best way to assess adequately the combined impacts of similar actions or reasonable alternatives to such actions is to treat them in a single impact statement" (40 CFR 1508.25 (a) 3). We are especially concerned that the noise impacts from these actions were not evaluated together in the same impact assessment. In this case, there is both common timing and geography. The Fallon Range Notice of Intent to prepare an EIS was published (July 2013) before the completion of the EA for Airfield Operations at Naval Air Station Fallon (August 2013), therefore both actions were under	Although there may be similar timing between the Environmental Assessment for the NAS Fallon Airfield (hereinafter Airfield EA) and the FRTC EIS, the geography is distinct and separate. The Airfield EA focused on the area potentially affected by proposed airfield operations at NAS Fallon within Class D airspace. Aircraft arriving and departing from NAS Fallon do not all train in the FRTC, nor do all aircraft using the FRTC originate from NAS Fallon. Even if no aircraft flights were initiated from NAS Fallon, the Navy and other services would continue to train on the FRTC. In contrast, the FRTC EIS provides an evaluation of the potential environmental effects of all training operations, air and ground, by all range users within the FRTC, irrespective of the origin of the users conducting the training operations. Therefore, airfield activities clearly have independent utility from the training activities conducted in the FRTC. The Airfield EA was identified as a related environmental analysis in Chapter 1 (Purpose and Need of the Proposed Action) of the FRTC EIS. As well, NAS Fallon airfield operations as assessed in the Airfield EA were evaluated in the analysis of Cumulative Impacts (Chapter 4) in the FRTC EIS. Chapter 4 (Cumulative Impacts) of the Final EIS has been updated and a figure has been developed depicting the noise contours associated with

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	NEPA review simultaneously and could have been coordinated, as we suggested in our July 8, 2013 scoping comments for Range Operations, as well as raised as a scope of analysis issue in our July 18, 2013 comments on the Draft EA for Airfield Operations. We understand that aircraft may arrive for training in the Fallon Range from other air stations; however, the DEIS states that aircraft "typically originate at NAS Fallon for training in the Fallon Range" (p. 3.4-21). According to the Navy, the actions of aircraft at the airfield were separated from the actions of those same aircraft in the greater Fallon range because of different controlling commands and different timing. If the Navy found evaluating the airfield operations together with the Fallon Range operations unworkable, the EIS should have ensured that the cumulative impact analysis in the EIS accounted for the noise impacts from the aircraft at NAS Fallon. According to the Navy, the noise increases for the airfield operations were not represented in the noise contours under the EIS's No Action Alternative, which represents the existing condition. The Navy states that this was because the airfield action has not yet occurred. The Navy could have ensured the noise impacts from the airfield operations were represented in the cumulative noise analysis, regardless of whether they were yet occurring. We note that there is precedent for doing this in the Guam and Commonwealth of the Northern Mariana Islands (CNMI) Military Relocation EIS. In the Guam EIS, the noise impacts from the ISR/Strike Force at Anderson Air Force Base, which were not yet occurring, were included in the noise contours and analysis for the increased training proposed in the Guam and CNMI Military Relocation EIS. This would be an appropriate way to evaluate cumulative noise in the Fallon Range EIS since the airfield actions were absent from the EIS scope of analysis. This is especially concerning since the EA revealed noise impacts at levels that could induce hearing loss (>80 A-weighted decibels) to 9 new receptors (p. 4-28). It is important that the noise impact modeling for the Fallon Range EIS account for these high noise	aircraft operations at NAS Fallon airfield and those associated with the FRTC. As can be seen from this figure, there is no overlap between the residents affected by aircraft noise in the range areas and those affected by aircraft noise in the areas surrounding the NAS Fallon airfield.

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	impacts that would occur within the range airspace. Recommendation: Revise the noise analysis to include the predicted noise estimates from the Airfield Operations EA, from which the majority of aircraft utilizing the Fallon Range originate. This would represent the noise analysis that would have been estimated had the Navy not separated the connected and similar actions of airfield and airspace use.	
EPA-15	Include a map of aircraft noise for Range B-19, since this was not included in the DEIS.	The DEIS states in Section 3.4 (Noise [Airborne]) that MR_NMAP was used to calculate the 60–85 dB Ldnmr contours, in 5 dB increments, for sorties occurring at B-19. The resulting Ldnmr contours for all FRTC aircraft operations combined do not reach or exceed 60 dB. This is due to the low number of events and the relatively high altitude of 7,000–15,000 ft. (2,133.6–4572 m) AGL for fixed-wing operations. Even though the helicopters operate at altitudes of 100–3,000 ft. (30.5–914.4 m) AGL, their numbers of operations combined with their single-event noise levels are insufficient to generate an Ldnmr of 60 dB or greater, and lands underneath this airspace are within Noise Zone I. Therefore, no noise map was made for Bravo 19 for aircraft activities.
EPA-16	Soils / Munitions Contamination Fallon Range Condition Assessment The DEIS indicates that Range Condition Assessments are required every 5 years (p. 3.1-2) and are reevaluated whenever significant changes (e.g., changes in range operations, site conditions applicable statutes, regulations, DoD issuances, or other policies) occur that affect determinations made during the previous assessment (p. 3.1-2). The most recent RCA was performed in 2008, but it is not clear whether an RCA is currently being performed according to the 5-year	The Navy's Range Sustainability Environmental Program Assessment (RSEPA) is a proactive way to ensure the Navy remains a good steward of the environment. The Range Condition Assessment (RCA) answers two primary questions: 1) Is the range in compliance with environmental laws and regulations? and 2) Are munitions constituents migrating off range? The FRTC RCA 5-year update is currently (as of November

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	requirement or would be performed as a result of the change in range operations. We requested and received a copy of the 2008 RCA from the Navy. We are concerned that the sampling design may not have been sufficient to accurately represent the contamination on the sites. The 2008 RCA indicates that sampling occurred by compositing 5 samples in the field. DoD's own studies show that 5 sample composites for explosives residues on bombing ranges performed very poorly in comparison to the incremental sampling methodology/multi-incremental sampling method in EPA Method 8330B using a minimum of 30 sampling increments. Recommendation: We recommend that the RCA be updated per the 5-year requirement and due to the changes in range operations that would occur under this action. We recommend that sampling occur in accordance with EPA Federal Facilities Forum Issue Paper: Site Characterization for Munitions Constituents, January 2012 to more accurately assess the level of contamination and the potential for off-site migration. The appropriate sampling design is discussed in EPA publication SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Method 8330B, Appendix A.	2015) being drafted as part of the 5-year requirement. The findings, conclusions, and recommendations for the update can be provided when complete. At a minimum, the RCA update would be initiated at the regular 5-year interval (around 2020). If a decision is made to implement Alternative 1 or 2, the RCA update could be initiated sooner, if deemed necessary based on the actual timing of changes in range operations. It should be noted that the proposed changes in range operations would be implemented gradually, rather than all at once. The intent of the sampling performed during the 2008 RCA was to verify the modeling conducted as part of the RCA to adequately answer the two primary questions of RSEPA (see above). The results were roughly the order of magnitude of the modeled potential munitions constituents in soil at FRTC targets. The analytical method that was used during the 2008 RCA update was appropriate given the data quality objectives of the investigation. The intent of the sampling (based on the RCA data quality objectives) was not to perform a site characterization like effort that would be appropriate for a munitions response site supporting a potential change in land use. The target areas have been and will continue to be used for many years for military training activities such as bombing practice using high explosives. Realistic target practice using live munitions is a necessary part of training the warfighter for the realities of war. Based on the results from the last RCA update and current range operations, additional sampling was not performed and is not required to meet the objectives of the next RCA update. The Navy's RCAs use multiple lines of evidence to develop findings, conclusions, and recommendations that are based on sound science to confirm munitions constituents are not

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		migrating off range and ensure compliance with appropriate environmental laws and regulations. The 2008 RCA as well as the current RCAs adequately answer the two questions using data quality objectives that are appropriate for the assessments. An increase of 10–15% in munitions usage would not exceed a threshold that would necessitate a revision to the conclusions made in the RCA.
EPA-17	Perchlorate The DEIS concludes there are no potential impacts from perchlorate compounds (3.1-13). The RCA states that the soil samples were analyzed for all munitions constituents (MCs) listed in the Range Sustainability Environmental Program Assessment manual except for perchlorate, and that a qualitative review of the mechanisms for release of perchlorate was conducted. This evaluation showed that potential perchlorate releases would be widely distributed across the ranges, and only a very small total mass of perchlorate could potentially be released, which would result in concentrations of perchlorate that would be well below typical detection limits. The Navy also concluded that it expects that perchlorate from other sources (i.e., geologic) may be present in greater concentrations, and any sampling effort would provide a documentation of perchlorate concentration from sources other than range operations (RCA, p. 5). We are concerned that the Navy has eliminated this compound from testing and has not followed the guidance of the Range Sustainability Environmental Program Assessment manual. Without quantitative sampling data, there is insufficient information to support the conclusions in the RCA and DEIS that perchlorate levels result in no potential impacts. Perchlorate is very soluble and exhibits little to no soil adsorption. Surface and groundwater contamination concentrations would build as a function of perchlorate loading. There is insufficient evidence in the DEIS that any deposition of	The Navy follows all DoD and DoN directives, instructions, policy, and guidance (including the RSEPA manual) for performing its range assessments. As discussed above, the current RCA update is ongoing. The RCAs use the data quality objective process and multiple lines of evidence that are based on sound science to support the conclusions. The informed and reasonable conclusions about perchlorate reached in the 2008 RCA were based on multiple lines of evidence including: (1) the numbers and types of munitions or training devices that are used; (2) how the devices are used, where the devices are used, where the devices will land; (3) the fact that perchlorate is nearly 100 percent consumed in a properly functioning device; (4) the fact that the ORC program regularly clears the ranges preventing an accumulation and potential source; and (5) mass loading modeling and vertical transport modeling conducted during the 2004 RCA (U.S. Department of the Navy 2004). During the 2004 RCA, predictive modeling was conducted in two stages to determine the potential for off-range release of perchlorate and the need for further analysis. The first stage, known as mass loading modeling, predicted potential concentrations of perchlorate in soil using munitions usage data, information about the compounds in munitions, conservative estimates of perchlorate consumption during use

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	perchlorate is likely to be below detection limits. Additionally, natural occurring perchlorate would likely occur in very small quantities, usually less than 1 part per billion, and would not render quantitative test results meaningless, as the DEIS implies. Recommendation: In the FEIS, indicate which munitions proposed for use on the ranges contain perchlorate, as identified in DoD's Munitions Items Disposition Action System (MIDAS) database, and the quantities that are expected to be released across the ranges. We strongly recommend that the Navy follow the guidance in the Range Sustainability Environmental Program Assessment manual and, in the next RCA, conduct the testing for perchlorate that was eliminated from the 2008 RCA sampling. Clarify, in the FEIS, when the next RCA will be conducted. If the Navy intends, in future RCAs, to continue to utilize the rationale that naturally-occurring background perchlorate levels would be present in greater concentrations than that originating from Navy training, we recommend that background sampling and testing using isotopic analysis methods be conducted to distinguish natural from man-made sources of perchlorate.	of the munitions, and information about sizes of targets. The second stage used the mass loading information and transport models to predict the potential vertical migration of perchlorate through soil to 1.64 ft. (0.5 m) below land surface and 24.6 ft. (7.5 m) below land surface (i.e., soil-groundwater interface). Vertical transport modeling predicted that perchlorate could migrate through soil to the soil-groundwater interface (24.6 ft. [7.5 m] below land surface), but the concentrations would be extremely low. The mass loading modeling predicted that perchlorate concentrations in surface soils could range from 0.000021 to 0.00046 milligrams per kilogram (mg/kg). These values are likely overestimates given the conservative assumptions used. The vertical transport modeling predicted that perchlorate concentrations in soils at the soil-groundwater interface could reach 0.000005–0.000013 mg/kg after approximately 300–400 years. All of these values are well below analytical detection limits for perchlorate in soils (approximately 0.002 mg/kg). During the 2008 RCA update, perchlorate was evaluated by reviewing the 2004 RCA modeling effort, reviewing usage of perchlorate-containing munitions, evaluating potential mechanisms of release, and conducting additional mass loading calculations. This analysis showed that the total mass of perchlorate that could potentially be released would be very small, and any perchlorate concentrations in soil would be well below typical detection limits. Therefore, perchlorate sampling and analysis was deemed unnecessary during the 2008 RCA update. The fact that perchlorate occurs naturally in the environment was a minor consideration in determining that perchlorate sampling and analysis was not necessary during the 2008 RCA update. Based on current training

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		activities, additional sampling is not required to meet the data quality objectives of the ongoing RCA update. Munitions containing perchlorate that would be used under the No Action Alternative are limited to illumination flares (e.g., LUU-2 and LUU-19) and Smokey Surface-to-Air Missile (SAM) simulators. The LUU-2 and LUU-19 are airborne parachute flares that are deployed to illuminate targets. The candle igniter disks in both flare units use small amounts of ammonium perchlorate (0.08 ounces [2.3 grams]), which is completely consumed when the flare functions as designed (U.S. Department of the Navy 2008). Specific failure rates for LUU-2 and LUU-19s are not available, but would be expected to be within the range of values presented in Table 3.1-1 of the Final EIS. Any flare that failed to ignite would be recovered during routine range clearance. Material recovered during the course of range clearance operations, including expended practice munitions, range scrap, and debris is inspected, certified, demilitarized, and processed for recycling or disposal in accordance with appropriate DoD regulations and standard operating procedures in the FTRC Operational Range Clearance Plan (U.S. Department of the Navy 2013). Approximately 16 LUU-2 and LUU-19s would be used on B-16, B-17, B-19, and B-20 annually under the No Action Alternative. Accumulation of measurable concentrations of perchlorate in soils from illumination flares is extremely unlikely for the following reasons: • The small amount of ammonium perchlorate in the flare igniters would be completely consumed unless a flare failed to function as designed. • A relatively small percentage of the total flares used would fail to operate.

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		• Flares that fail to ignite would be recovered and handled in accordance with the FTRC Operational Range Clearance Plan. The Smokey SAM is a small (15 in. [38 cm] long) rocket with a cardboard case and Styrofoam fins that is used to simulate the launch of a surface-to-air missile during flight crew training. It has an ammonium perchlorate/zinc-based rocket motor containing approximately 1.53 pounds (lb.) (0.69 kg) of propellant, 44 percent (0.67 pounds [0.30 kg]) of which is ammonium perchlorate (Godwin 2015; U.S. Department of the Navy 2008). The Smokey SAM is launched from a four-bay launcher having a metal plate at its base, thus preventing direct contact of the exhaust plume with the soil. As a solid rocket fuel, the ammonium perchlorate/zinc mixture is completely consumed after the rocket motor is ignited. Misfired rockets or igniters would not be released to the environment, but would remain in control of the Smokey SAM team and handled in accordance with the FTRC Operational Range Clearance Plan. In addition, the Smokey SAM team attempts to retrieve all expended rocket bodies on the day of launch. If time or conditions do not permit same day recovery, the team attempts to retrieve the expended rocket bodies no more than two weeks after launch (U.S. Department of the Navy 2008). Any expended rocket bodies missed by the Smokey SAM team would be recovered during routine range clearance. As noted above, material recovered is inspected, certified, demilitarized, and processed for recycling or disposal in accordance with appropriate DoD regulations and standard operating procedures in the FTRC Operational Range Clearance Plan. Approximately 300 Smokey SAMs would be used annually under the No Action Alternative. Accumulation of measurable concentrations of perchlorate in soils from

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		Smokey SAMs is extremely unlikely for the following reasons: • The Smokey SAM launchers have a metal base plate that prevents direct contact of the exhaust plume with the soil. • The ammonium perchlorate/zinc mixture is completely consumed after the rocket motor is ignited. • Misfired rockets are not released into the environment. • Expended rocket bodies are recovered after launch. Perchlorate would not be expected to have a measureable effect on soils under the No Action Alternative. Concentrations of perchlorate in soils would not represent a substantial threat of a release to an off-range area that poses unacceptable risk to human health or the environment. There would be no significant impacts on soils from possible contamination under the No Action Alternative. No new perchlorate-containing munitions would be used under Alternatives 1 or 2. Additionally, annual usage of illuminations flares and Smokey SAMs under Alternative 1 and Alternative 2 would remain the same as the No Action Alternative. Accumulation of measurable concentrations of perchlorate in soils from illuminations flares and Smokey SAMs is extremely unlikely under Alternatives 1 and 2 for the same reasons discussed for the No Action Alternative. Section 3.1 (Soils) of the Final EIS provides additional information and analysis regarding the potential for perchlorate contamination from training activities at FRTC.
EPA-18	Operational Range Clearance Plan and Impacts The DEIS states that the Fallon Operational Range Clearance Plan was completed in 2013 for NAS Fallon and the FRTC. The Plan was not included in the DEIS, but the DEIS states that its continued implementation would substantially reduce potential impacts on	Section 3.3 (Water Quality) of the Final EIS provides additional specifics about the Operational Range Clearance Plan, including discussion and analysis of potential impacts associated with BIP detonations used during range clearance. When a munition is identified by EOD personnel as UXO and

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	groundwater, and concludes that potential impacts on groundwater at the training ranges would not be significant (pp. 3.3-22 – 3.3-24) and, overall, would be negligible (p. 3.3-26). While regular range clearance may reduce concentrations of munitions constituents, the DEIS does not identify the potential risk of contamination from range clearance when blow in place (BIP) detonations of unexploded ordnance (UXO) are performed. BIP of UXO can result in a greater amount of residue deposition than if the munitions functioned as designed on impact. High order detonations and occasionally low-order detonations can cause significant deposition of MCs. Recommendation: Include as an appendix and/or summarize the Operational Range Clearance Plan in the FEIS. Disclose the impacts from high order and low-order BIP detonations that are part of range clearance activities, and discuss the effectiveness of the Plan as mitigation, taking such impacts into consideration.	unsafe to move, BIP is required to address the acute and extreme explosive safety hazard. BIP is performed to ensure a safe work environment for range personnel and is unavoidable. Typically, C4 is used for BIP with both it and the explosive from the munition being nearly 100% consumed in the resulting detonation. The risk from not addressing explosive safety concerns from UXO far outweighs any potential chronic hazard from potential munition constituents being unconsumed in a BIP event. The RSEPA process takes into account the necessity to perform BIP to ensure a safe work environment by factoring in this requirement into the two primary questions.
EPA-19	Lead Contamination from Small Arms Ranges The proposed action would substantially increase the amount of small- and medium-caliber live rounds expended on the ranges. The tons per year of live rounds would more than double on range B-16 (from 15 to 32 tons per year) (p. 3.3-11), and increase by 5 tons per year across the other ranges. The DEIS indicates that lead is the primary constituent of concern because of its toxicity and ability to persist in the environment, but states that lead is relatively immobile because of the pH of the soils and the limited precipitation in the project area (p. 3.3-12). The latter factors are relevant to transport through soil; however, studies show that lead mobilization occurs chiefly by wind and surface water erosion, generally not by dissolution and leaching through soil. The type and frequency of	Section 3.1 (Soils) of the Final EIS includes an updated discussion of small arms range configuration and potential accumulation of lead. Sections 3.1 (Soils) and 3.3 (Water Quality) of the Final EIS include BMPs to monitor and adaptively manage lead accumulation. Four small arms ranges (pistol/shotgun range, M16 zero range, automatic record fire range, and rifle/machine gun range) are located within the B-19 boundary. The ranges are adjacent to each other and the firing lines run east-west along the main access road. All down range target lines are in a northern direction to the B-19 High Explosive Impact Area. Given the available space, terrain of the area, and use of the existing impact area, these small arms ranges do not have berms or backstops. Therefore, some

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	maintenance performed on the backstop and range floors affects the ability for off-site transport. The DEIS states that spent small- and medium-caliber rounds would not be removed at regular intervals, but would slowly accumulate in soils over long periods of time in areas of concentrated use (p. 3.1-14). The DEIS does not identify any best management practices or maintenance measures to prevent erosion of berms and backstops, which are highly susceptible to erosion during rainstorms and could provide a transport mechanism for lead attached to soil particles. The increased intensity of rainstorms predicted and already occurring under climate change add to the risk for eroded soil to be transported off-site by stormwater. The DEIS indicates that several major ephemeral stream channels converge northwest of B-16 and cross the training area as they flow to Carson Lake (p. 3.3-8). An additional route of transport that was not discussed in the DEIS is air transport. At small arms ranges, lead dust may enter the air from the small arms barrel plume or fugitive dust generation. The transport of lead through the air, with final deposition to surface water or soil, is an important transport mechanism; therefore, lead's ability to contaminate adjacent lands can be expected to be proportional to the amount of lead loading at ranges. Recommendation: Discuss the potential impacts of lead mobilization by wind and water erosion. Identify best management practices to reduce this potential and ensure they are implemented on the ranges as part of the proposed action. The following practices are identified in the U.S. Army document Prevention of Lead Migration and Erosion from Small Arms Ranges and should be evaluated in the FEIS: • Physical removal of lead from backstops on a regularly scheduled basis. A sifting/screening process is described in the above	BMPs for small arms ranges with berms are not appropriate for use on the FRTC small arms ranges. Lead accumulation on the small arms ranges would be monitored and adaptively managed by implementing appropriate management practices such as erosion control, lead removal, and pH monitoring and modification.

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	document. • Soil pH monitoring and modification if necessary. The DEIS indicates that soils in B-16 are strongly alkaline (p. 3.1-5) and are mildly to strongly alkaline on the other ranges, with pH levels ranging from 7.0 – 9.4 (p. 3.1-14). Lead is least mobile between a pH of 6.5 and 8.5. • Contouring or reshaping backstops to direct or reduce the velocity of runoff. Soil erosion on backstops is the principal mechanism for transport of lead on training ranges to surface water.	
EPA-20	Fugitive dust The DEIS does not evaluate the fugitive dust impacts quantitatively, but identifies various activities that would generate fugitive dust and concludes that Best Management Practices would minimize dust (p. 3.2-17). The list of BMPs includes the following: “When warranted, water or another dust palliative product would be used as necessary to minimize generation and downwind migration of fugitive dust, especially on dry, windy days”. Recommendation: In the FEIS, provide more information on how this BMP would be implemented, including how personnel would determine when this BMP is warranted, and whether water or dust palliative products would be present onsite during training.	Section 3.2 (Air Quality) of the Final EIS includes an updated discussion of management practices to minimize dust. The Navy uses practical methods to prevent particulate matter from becoming airborne during training activities at FRTC. Fugitive dust is moderated by adhering to standard operating procedures contained in Chapter 5 of the *FRTC Range Operations Manual*: • Vehicles shall be operated only on established roads; and • Vehicles shall adhere to posted speed limits and drive at safe speeds commensurate with conditions. In addition, conditions could be evaluated before starting a large-scale ground training event to determine if additional dust abatement measures, such as watering high use areas or other measures in the NAS Fallon Dust Control Plan (NAS Fallon 2004), are warranted. The need for additional dust abatement measures would be determined on a case-by-case basis during pre-exercise planning with input from the NAS Fallon Environmental Division. Factors considered in determining the need for additional dust abatement include the locations, duration and number of vehicles involved in the exercise; soil moisture conditions prior to the exercise; and predicted precipitation, wind speed, and wind direction during

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		the exercise. As described in the Dust Control Plan, water and watering equipment are available at NAS Fallon for use in FRTC. In addition, some units training at FRTC may choose to use water trucks in their equipment inventory or dust palliatives other than water.
EPA-21	Climate Change The DEIS includes a good general discussion of climate change and greenhouse gas (GHG) emissions. The discussion includes a percentage breakdown of carbon dioxide (CO2) emissions of various domestic transportation sources, revealing that the largest sources are passenger cars and light-duty trucks (61% of CO2 emissions) and medium- and heavy-duty trucks (22%), with commercial aircraft at 7% (p. 4-38). While aviation, in general, represents a small percentage of fossil fuel use, it is important to discuss the unique impacts aviation emissions contribute due to their release at altitude. The majority of aircraft emissions occur high in the atmosphere and the impact of burning fossil fuels at altitude is approximately double that of burning the same fuels at ground level. In addition, the mixture of exhaust gases discharged from aircraft perturbs radiative forcing (the heating effect caused by GHGs in the atmosphere) 2 to 4 times more than if the exhaust was CO2 alone. Emissions from jet aircraft also lead to the formation of cirrus clouds, as the condensation trails (contrails) of water vapor and sulfur particles emitted from engines at high altitudes form ice crystals that persist as clouds under some atmospheric conditions. Scientists are uncertain how to measure the occurrence and impact of such clouds, but they are reasonably certain that the clouds add to the greenhouse effect of aircraft emissions, perhaps substantially. The DEIS provides predictions of annual GHG emissions that would	(1) Section 4.5 (Climate Change), Subsection 4.5.3 (Greenhouse Gas Emissions in the United States) of the Final EIS includes a discussion of the unique climate change impacts of burning fossil fuels at altitude, as follows: While aviation, in general, represents a small percentage of fossil fuel use, it is important to note the unique impacts aviation emissions contribute due to their release at altitude. The majority of aircraft emissions occur high in the atmosphere and the impact of burning fossil fuels at altitude is greater than burning the same fuels at ground level (particularly with regard to NO_x) (Intergovernmental Panel on Climate Change 1999). In addition, the mixture of exhaust gases discharged from aircraft perturbs radiative forcing directly through the heating effect and indirectly through affecting the microphysical processes of cirrus clouds formations. Due to the uncertainties associated with various physical and chemical modeling, it is difficult to accurately estimate the climate impact from the GHG emissions from this proposed project. The total aviation radiation forcing, including the aviation-induced cirrus effect, is estimated to be 78 milliwatts per square meter, which represents 4.9% of total anthropogenic forcing (Lee et al. 2009).

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	occur under the alternatives and calculates these values as a percentage of total U.S. GHG emissions (Table 4-4, p. 4-39). The Council on Environmental Quality recently released revised draft guidance for Federal agencies on the consideration of GHG emissions and climate change impacts under NEPA. Recognizing that climate impacts are not attributable to any single action, but are exacerbated by a series of smaller decisions, the draft guidance discourages unqualified statements in NEPA documents that the emissions from a particular proposed action represent only a small fraction of local, national, or international emissions, as not helpful to the decision-maker or public (CEQ draft guidance, p. 6). The climate change discussion also identifies the Navy's goals of improving energy security and environmental stewardship and reducing reliance on fossil fuels (p. 4-37). While the DEIS identifies the general actions that the Navy is taking to address climate change, it does not identify DoD's specific actions regarding aircraft emissions, which relate more closely to the proposed action. According to the U.S. Aviation Greenhouse Gas Emissions Reduction Plan, DoD and its various branches have a number of specific military propulsion programs and initiatives underway to improve aircraft energy efficiency, which will also reduce GHGs. These include the VAATE (Versatile Affordable Advanced Turbine Engines) Program and several technology development programs under VAATE that strive to meet specific energy goals; the Adaptive Versatile Engine Technology (ADVENT) Program, which is developing critical technologies to provide military turbofan engines with 25 percent improved fuel efficiency to reduce fuel burn and provide more range, persistence, speed and payload; and the Adaptive Engine Technology Development (AETD) program, which seeks to accelerate technology maturation and reduce risk for transition of these technologies to a military engine in the 2020+ timeframe. Such technology would be	(2) Based on Navy understanding of the Council on Environmental Quality recently released revised draft guidance for Federal agencies on the consideration of GHG emissions and climate change impacts under NEPA, the Navy will retain computations of project GHG emissions as a percentage of total U.S. GHG emissions (Table 4-4, p. 4-39). The draft guidance discourages unqualified statements in NEPA documents that the emissions from a particular proposed action represent only a small fraction of local, national, or international emissions, as not helpful to the decision-maker or public (CEQ draft guidance, p. 6). However, the statements made in the FRTC EIS are not unqualified and therefore the Navy believes that the percentages shown in Table 4-4 are helpful to the decision –maker and public. 3) Section 4.5 (Climate Change), Subsection 4.5.2 (Regulatory Framework) of the Final EIS includes a few paragraphs highlighting the programs the DoD and the Navy is investing in to increase fuel efficiency for military aircraft, as follows: DoD is taking specific actions regarding aircraft emissions. According to the U.S. Aviation Greenhouse Gas Emissions Reduction Plan (International Civil Aviation Organization 2012), DoD and its various branches have a number of specific military propulsion programs and initiatives underway to improve aircraft energy efficiency, which will also reduce GHGs. These include the VAATE (Versatile Affordable Advanced Turbine Engines) Program and several technology development programs under VAATE that strive to meet specific energy goals; the Adaptive Versatile Engine Technology (ADVENT) Program, which is developing critical technologies to provide military turbofan engines with 25 percent improved fuel

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	applicable to a range of military aircraft (fighters, bombers, etc.). Recommendations: We recommend that the FEIS: (1) include a discussion of the unique climate change impacts of burning fossil fuels at altitude, as explained above; (2) remove computations of project GHG emissions as a percentage of total U.S. GHG emissions; and (3) highlight the programs the DoD is investing in to increase fuel efficiency for military aircraft.	efficiency to reduce fuel burn and provide more range, persistence, speed and payload; and the Adaptive Engine Technology Development (AETD) program, which seeks to accelerate technology maturation and reduce risk for transition of these technologies to a military engine in the 2020+ timeframe. Such technology would be applicable to a range of military aircraft (fighters, bombers, etc.). In a complementary effort, the President directed the Navy, DOE, and USDA to make investments in the construction and operation of three biorefineries that will produce up to 100 million gallons of cost competitive alternative diesel and jet fuel beginning in 2016 (International Civil Aviation Organization 2015). The FAA and DoD are working together with industry to coordinate and fund alternative jet fuel testing activities that support fuel approval. NASA, FAA and the U.S. Air Force are leading efforts to understand the benefits of alternative jet fuels on emissions that impact air quality and contrail formation. The Navy is taking other actions ashore to implement Executive Order 13693 (Planning For Federal Sustainability in the Next Decade). The Navy is implementing sustainable practices for energy efficiency, greenhouse gas emissions avoidance or reduction, and petroleum products use reduction. Pursuant to OPNAV Instruction 4100.5E-Shore Energy Management (22 Jun 2012), it is the Navy policy to ensure energy security and legal compliance by increasing infrastructure energy efficiency and

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		integrating cost-effective and mission-compatible alternative energy technologies while providing reliable energy supply ashore. Among several mandates, according to OPNAV Instruction 4100.5E, the Navy shall achieve a 30 percent facility energy intensity reduction by 2015; reduce consumption of fossil fuel and increase the use of alternative fuels by the Navy's non-tactical vehicle fleet; and reduce greenhouse gas emissions. In the most cost effective manner, the Navy will meet the following DoN shore energy goals: 1) Fifty percent ashore consumption reduction by 2020. 2) Fifty percent total ashore energy from alternative sources by 2020. 3) Fifty percent of installations net-zero consumers by 2020. 4) Fifty percent reduction in petroleum used in the commercial vehicle fleet by 2015.
JJ. Goicoechea Eureka Board of Commissioners	Dear Ms. Kelley: Eureka County, Nevada is a unit of local government under and adjacent to the Fallon Range Training Complex. We have been following with interest the Navy's efforts to prepare an Environmental Impact Statement to accommodate increased levels of training on the Complex. Eureka County Commissioner Mike Sharkozy attended the Scoping meeting in Crescent Valley on June 11, 2013. We were also represented at the DEIS public meeting on February 19, 2015. We appreciate the unique nature of the FRTC and the service it provides for military training, readiness and emergency response. We are also a participant in the Fallon NAS Joint Land Use Study and EIS preparation. In reviewing the FRTC Draft EIS, we noticed that some	Thank you for your participation in the NEPA process. Where appropriate, the Final EIS has been revised to indicate the location and distance information for the Town of Eureka.

Commenter	Comment	Navy Response
	maps show the Town of Eureka, our County seat, and some do not. For the purposes of understanding the location of the eastern boundary of the FRTC in Eureka County, it would be helpful to have the map expanded to show Eureka, and some information on the distance between the boundary's eastern edge and the town of Eureka.	
Eureka Board of Commissioners - 2	Eureka County supports, invests in and promotes the use and development of the Eureka County Airport (05U) in Diamond Valley, just east of the FRTC. Obviously operations in the FRTC affect our ability to attract users and promote businesses. In considering airports under and near the FRTC, the Eureka Airport was not listed, but for example the Elko and Ely airports (also not under the FRTC) were. For our planning purposes as well as yours, we respectfully request that the DEIS address impacts to general aviation east of the FRTC including impacts to the Eureka airport.	The Final EIS Transportation section (Section 3.8) has been updated to include information regarding the Eureka Airport. As stated in the FEIS, there would be no adverse impacts to general aviation regarding access or usability of the current training area because the Navy is not proposing to add or change any of the boundaries or operating hours of the current Military Operating Areas or Restricted Areas that comprise the FRTC Study Area. General aviation outside the FRTC airspace (which includes Eureka airport) would not be adversely impacted by the Proposed Action.
Eureka Board of Commissioners - 3	We have the following specific comments, noted below: Table ES-2, 3.7 Socioeconomic et al. Effects and throughout document: Alternatives 1 and 2 state that "local activities would need to schedule use of airspace, but there would be no significant impact of change in economic activity related to farming and ranching operations." This appears to be a change from the No Action Alternative. If this is correct, please explain what "local activities" means, and describe what economic activities would be impacted by the change.	The analysis of the No Action Alternative in Section 3.7 (Socioeconomics) indicates that aviation activities need to schedule with NAWDC for use of military airspace. There is no change in this requirement from the No Action Alternative. Most SUA is established for military or government use; however, it may also be accessed for civilian air traffic when not reserved for military or government use. Close coordination between military and civilian air traffic control facilities enables safe, effective, real-time use of the FRTC SUA. Under this procedure, regardless of the schedule for the use of a military airspace, civilian aircraft may use SUA until a military aircraft is actually en route to that area. The bulletized list in the Executive Summary of the Final EIS has been updated to include this conclusion from the No Action Alternative.
Eureka Board of	Table ES-2 3.8 Transportation: Please rewrite third bullet in all three	The bulletized list in both the Executive Summary and the

Commenter	Comment	Navy Response
Commissioners - 4	columns: Sentence meaning is unclear.	Transportation section (3.8) of the Final EIS has been revised for clarity.
Eureka Board of Commissioners - 5	Page 1-2, Figure 1-1 and throughout document: Please expand map to the east to help readers understand where the eastern boundary of the FRTC is in relation to the Town of Eureka. For example, Figure 3.4-8 on page 3.4-17 does extend beyond the eastern FRTC border which is more helpful with the notation of Roberts Mountain.	Where appropriate, the Final EIS has been revised to indicate the location and distance information for the Town of Eureka.
Eureka Board of Commissioners - 6	Page 3.6-3, 3.6.2.3.3 Eureka County: Third paragraph, second sentence is not accurate and should be deleted. Page 3.7-13 3.7.2.6 Please refer to and incorporate Eureka County's Socioeconomic Report for the most recent socioeconomic data including current enrollment statistics. http://www.yuccamountain.org/trends14/education.htm. Eureka County School District description is incomplete. The District also operates an elementary school in Crescent Valley. The school district's student population in 2013 was 278. Also, "City of Eureka" is incorrect; Eureka is an unincorporated town.	Thank you for providing additional information regarding Eureka County. Socioeconomic information is presented from the U.S. Census Bureau rather than regional sites to allow for a standardized set of data that can be compared over time. The information in Section 3.6.2.3.3 (Eureka County), third paragraph, second sentence was updated to be consistent with information on the Eureka County website. The information regarding current enrollment Eureka County School District has been revised in the FEIS to reflect the latest information from Nevada Department of Education for the 2014–2015 school year, which is 247 students combined in the three schools.
Eureka Board of Commissioners - 7	Page 3.7-18 and 3.7-21, Economics and Usability: Second paragraph is unclear as to whether the Alternatives proposed will or will not affect economic activity, especially related to the use of the Eureka airport. Is scheduling of airspace going to be more difficult? Are there any changes for private pilots flying aircraft to and from the Eureka airport? Does the increase in training prevent or inhibit the use of the Eureka airport for economic development projects? These comments also affect Table 3.7-7.	The increase under Alternative 1 or Alternative 2 would not affect local aviation traffic or the process of scheduling use of military airspace. Local aviators still need to coordinate activities that require entrance into Restricted Airspace during active hours with air traffic control. Additionally, the increase in air activities under Alternative 1 and 2 do not result in changes to the rules private pilots follow flying to and from Eureka airport. Therefore, the proposed increase in training does not prevent or inhibit the use of the Eureka airport for economic development projects.
Eureka Board of Commissioners - 8	Page 3.8-10 Table 3.8-2 FAA Registered Airfields Under or Near the FRTC SUA: Table does not list Eureka Airport (05U) which is closer to	Where appropriate, the Final EIS has been revised to indicate the location and distance information for the Eureka Airport.

Commenter	Comment	Navy Response
	the FRTC than Elko Airport or Ely airport. We believe that it is appropriate to list the Eureka Airport because activity at the airport is subject to and influenced by FRTC flight rules and activity.	
Nevada Division of Environmental Protection Bureau of Water Pollution Control (NDEP-BWPC)	The Nevada Division of Environmental Protection (NDEP), Bureau of Water Pollution Control (BWPC) has received the aforementioned State Clearinghouse item and offers the following comments: The project may be subject to BWPC permitting. Permits are required for discharges to surface waters and groundwater's of the State (Nevada Administrative Code NAC 445A.228). BWPC permits include, but are not limited to, the following: • Stormwater Industrial General Permit • De Minimis Discharge General Permit • Pesticide General Permit • Drainage Well General Permit • Temporary Permit for Discharges to Groundwater's of the State • Working in Waters Permit • Wastewater Discharge Permits • Underground Injection Control Permits • Onsite Sewage Disposal System Permits • Holding Tank Permits Please note that discharge permits must be issued from this Division before construction of any treatment works (Nevada Revised Statute 445A.585). For more information on BWPC Permitting, please visit our website at: http://ndep.nv.gov/bwpc/index.htm.	The Navy has reviewed the proposed training activities and the Nevada Division of Environmental Protection (NDEP), Bureau of Water Pollution Control (BWPC) permitting requirements, and has determined that BWPC permits are not applicable to the proposed training activities.
(NDEP-BWPC-02)	Additionally, the applicant is responsible for all other permits that may be required, which may include, but not be limited to: • Dam Safety Permits - Division of Water Resources • Well Permits - Division of Water Resources • 401 Water Quality Certification - NDEP	The Navy has reviewed the proposed training activities and the other permitting requirements, and has determined that other permits are not applicable to the proposed training activities.

Commenter	Comment	Navy Response
	• 404 Permits - U.S. Army Corps of Engineers • Air Permits - NDEP • Health Permits - Local Health or State Health Division • Local Permits - Local Government Thank you for the information and the opportunity to comment.	
Skip Canfield State Land Use Planning Agency Nevada Division of State Lands Department of Conservation and Natural Resources	As part of the DEIS - NAS Fallon Range Training Complex - Readiness Activities project, please consider the cumulative visual impacts from development activities (temporary and permanent). Utilize appropriate lighting: • Utilize consistent lighting mitigation measures that follow "Dark Sky" lighting practices. • Effective lighting should have screens that do not allow the bulb to shine up or out. All proposed lighting shall be located to avoid light pollution onto any adjacent lands as viewed from a distance. All lighting fixtures shall be hooded and shielded, face downward, located within soffits and directed on to the pertinent site only, and away from adjacent parcels or areas. • Any required FAA lighting should be consolidated and minimized wherever possible.	The Proposed Action does not include any new temporary or permanent development or construction activities. Therefore, no new lighting sources are proposed.
John Christopherson, Natural Resource Program Manager Nevada State Division of Forestry	The EIS does not address potential impacts to plants on the Nevada State List of Critically Endangered Plants. On Page 3.5-10 of the document, Section 3.5.2.2.1 "Special Status Species", the EIS states there are no Federally listed plant species known to exist on Navy-administered lands of the FRTC. However, there is no mention made of State-listed plants. It is not clear if the EIS authors checked with the Nevada Natural Heritage Program for the potential for state-listed plants in FRTC.	The Nevada Natural Heritage Program was checked for listing of all species in Churchill County and cross checked with the plant inventory listed in the 2014 Integrated Natural Resources Management Plan for NAS Fallon. The statement on page 3.5-10 of the Final EIS has been updated to indicate that there are 4 species of plants that could occur on NAS Fallon-administered lands (none greater than an S2S3 status). These species are included in the analysis on vegetation from ground-disturbing activities at FRTC.

Table F.3-3 contains comments from tribes received during the public comment period and the Navy's response. Responses to these comments were prepared and reviewed for scientific and technical accuracy and completeness. Comments appear as they were submitted and have not been altered with the exception that expletives, addresses, and phone numbers have been removed, as necessary.

Table F.3-3: Responses to Comments from Tribes

Commenter	Comment	Navy Response
Cynthia Oceguera	01/23/2015 federal Register sites the Notice of Public Meeting for the draft environmental impact statement for Military Readiness Activities at the Fallon Range Training complex. I have not seen improved signage for this site for years. Walker River Paiute Reservation consists of over 323,406 acres of which the training site is located. I have learned we were not included in the communications as indicated per federal register. I encourage notification of future activities be directed to our Tribal Chairman Bobby Sanchez and the Tribal Council Members in a timely manner for our leadership to attend consultations. We Learned about the meeting in Fallon on the 23 of Febuary that was held on the 19th. To be respectful of our leadership I find myself disappointed we have not been included through not fault of ours. I further understand their has been two Naval Commander changes since our Mou and Resolution was completed. I have recommended both items be updated To our Chairman and Vice Chairman, Randall Jack. I have interviewed other elders, community people ans staff who have comments I have permission to share.	On May 16, 2013, notice of intent correspondence were mailed to the Honorable Lorren Samnaripa, Chairman of the Walker River Paiute Tribe. Additionally, letters of availability and notification of public meeting were mailed to the tribes on January 23, 2015. As described at the beginning of this Appendix, additional regional outreach occurred, including newspaper publications, postcard mailers, news releases, and Public Service Announcements, all of which indicated the date, time, and location of the public meeting. We appreciate the inclusion of an updated contact for the Tribal Chairman in your Draft EIS comment. As a result of your comment, the Navy sent letters to the federally recognized Tribes in the region (which was followed up with confirmation of receipt) which continued consultation in regard to the subject Undertaking in accordance with 36 CFR 800, regulations implementing Section 106 of the National Historic Preservation Act (NHPA) of 1966 (16 USC 470f), as amended. Additionally, the Navy offered the opportunity to meet face-to-face with each tribe to discuss the Undertaking in early June 2015. The Walker River Paiute Tribe was the only tribe that accepted the Navy's invitation for a meeting. The meeting was held June 1, 2015, and additional communications have occurred since the meeting. The Navy has initiated Government-to-Government contact to express its desire to pursue a Memorandum of Agreement with the Tribe to enhance communications and foster a long-term working relationship with the Tribe on items of mutual interest.

Commenter	Comment	Navy Response
Oceguera - 2	Corey Tom, Tribal Air Quality Tech, shares my concern for the OZone Levels. Mr. Tom stated he believes Fallon was approaching the National Standard and EPA lowered the standard. "What impact will the increased flights have on the new standard?" He believes it would push Fallon over the National Standard. Walker River Tribe should be monitoring the Ozone Levels but presently is not. We would like the opportunity to have a plan to get this program to us? What are the plans for the monitoring of the Ozone levels?	The process for changing the emissions standards is an Environmental Protection Agency (EPA) process and occurs independently of Naval readiness activities In 2008, the EPA significantly strengthened its national ambient air quality standards (NAAQS) for ground-level ozone, the primary component of smog. The Air Quality Trend Report 2000–2010 (Nevada Division of Environmental Protection 2011) indicated that for ground-level ozone, the ambient concentrations of O3 have remained steady and below the current 2008 national ambient air quality standards. Section 3.2 (Air Quality) of the EIS analyses the historical and anticipated levels of ozone and concluded that there would be small increase relative to baseline Nevada emissions. Measurable changes in air quality would be expected locally, but the attainment status in the Northwest Nevada Intrastate Air Quality Control Region and Nevada Intrastate Air Quality Control Region would not be affected. With regards to air quality monitoring in the region, the Nevada Air Pollution Control Program operates a network of monitoring stations across Nevada's 15 rural counties. The monitors conform to all U.S. Environmental Protection Agency siting criteria and are situated to measure air quality in both rural and urbanized portions of Nevada's 15 rural counties: Carson City, Churchill, Douglas, Elko, Esmeralda, Eureka, Humboldt, Lander, Lincoln, Lyon, Mineral, Nye, Pershing, Storey, and White Pine.

Commenter	Comment	Navy Response
Oceguera - 3	We are a small community but involved with the impact of our affairs to protect future envirionmental concerns, culture, safety issues and other potential opportunities to identify the disturbed areas already contaminated. Thousands of acres of land is contaminated and vegetation has not been addressed which was due to UXO contamination. This should also be a consideration in the project plan or the tribe can bring forth further negotiations in an updated MOU. Please note the following from draft: 3.3.3.1.1 Potential Release of Contaminants; 3.4.1.1.1 Sound Characteristics; 3.7.1.3 Approach to Analysis. We would be very interested in the analysis of the potential for adverse human health or environmental effects to Walker River Tribe and other tribal reservations. The future consultations with Walker River so we may be involved in the decision making process is appreciated. What data is available for the historical suffering from environmental health risks and hazards. our tribal government remains our constant despite our lack of resources and remote surroundings. I would ask our concerns be addressed in the process of developing the final report for approval. We do support the protection and the continued training of our military personnel. Prior to increased bombings happen, I encourage bringing tribes to the current status of MOU's and Tribal Resolutions. Thank you for this opportunity to voice my comments. I look forward to hearing from you in regards to the response for the final report. Respectfully submitted Cynthia Oceguera	The issue of inadvertent release of munitions on the Walker River Paiute Reservation became apparent in February 1989. The Navy implemented operational changes in November 1989 to reduce or eliminate subsequent off-range munitions, including reorienting strafing/bomb run-in lines and increasing surveillance of all drops. These operational changes have been effective based on NAWDC Range Office data, which show no incidents of off-range munitions at B-19 from 2001 through present (September 2015). In addition to the operational changes, the Navy conducted UXO survey and clearance on affected portions of the Reservation in 1989–1990 and 1998–1999. The Walker River Paiute Tribe and Navy have considered several alternatives to bring closure to the issue, but have not yet reached a final resolution. Resolution of the off-range munitions issue is will continue to be addressed with the Walker River Paiute Tribe and is not considered further in this EIS. In accordance with Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, DoD policies, the National Historic Preservation Act, and Navy instructions, the Navy engaged in Tribal consultations following release of the FRTC Draft EIS. Additional consultation efforts were initiated in spring 2015, which included follow-up communications with the Walker River Paiute Tribe, an in-person meeting with the Tribe on June 1, 2015, and additional communications following the meeting. The Navy has initiated Government-to-Government contact to express its desire to pursue a Memorandum of Agreement to enhance communications and foster a long-term working relationship with the Tribe on items of mutual interest.

Table F.3-4 contains comments from private individuals received during the public comment period and the Navy's response. Responses to these comments were prepared and reviewed for scientific and technical accuracy and completeness. Comments appear as they were submitted and have not been altered with the exception that expletives, addresses, and phone numbers have been removed, as necessary.

Table F.3-4: Responses to Comments from Private Individuals

Commenter	Comment	Navy Response
Adell Panning Private Individual (online)	My biggest concern with all of this is the fact that in short reading of this HUGE document it looks as if you are increasing the amount of flying over our town. We have had structural damage to our home due to the sonic booms caused by this training as well as the over all shock when they hit. It has for years caused our animals to become upset. I know for a fact that there have been numerous complaints put in on this. I am all for training ans support you completely on that fact but with all of the unpopulated areas in this state I simply do no understand why you need to fly over any populated area for this training. My next concern is this document itself. Do you really think that the general public will be able to understand all that is in here? I am far from undereducated and 10 pages into it I was ready to be finished. I don't feel that you have explained the true impact that this can cause in terms that the general public of this area will understand. Lastly, why is the public meeting only being held in Fallon? Is there going to be a public meeting in Crescent Valley?	Thank you for your participation in the NEPA process. Under the Proposed Action, the number of flight activities will increase compared to the No Action Alternative. The Navy recognizes its proximity to surrounding communities and has attempted to structure its training activities to achieve operational readiness while minimizing any potential impact to the surrounding area. In light of this proximity, the Navy has developed management practices and operating procedures for activities that may cause an impact to the environment or surrounding area and has presented these in the EIS (Section 3.4.1.2 [Regulatory Framework and Management Practices]). With regards to noise complaints, the Navy's Public Affairs Officer at NAS can be contacted for noise complaints and operational suggestions at 702-426-2880. The decision to conduct a single meeting in Fallon, NV, during the public comment period was partially a result of minimal public contribution during the scoping period (only four comments were submitted at the scoping meetings, none negative). For most regional issues, local political and volunteer communication in the area is electronic, therefore it was determined that NEPA outreach and public involvement requirements could be met with a single public meeting combined with public notification efforts via newspaper, website, postcard mailers, fliers, and news releases.

Commenter	Comment	Navy Response
Jean Public Private Individual (online)	oppose this project at fallon because of the contamination and polution that the us military brings to every site they have ever had in this country. then the military doesnt tell its empoyees of the toxicity and they die of cancer. no more land should be given to the ilitary in america. use what you previously had, that is enough. yoiu are full of greed to destroy nature. we dont want that. wild horses need to live in nevada. the blm is killing them all. selling them to slaughterers etc and forcing them to live in horrific brutalc donditions in corrals. you are causing this. ugly as sin i say	Thank you for your participation in the NEPA process. The purpose of the NEPA process is to insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. This Draft and Final EIS analyzes the potential environmental effects of the proposed action. Detailed analysis is provided on Soils (Section 3.1), Air Quality (Section 3.2), Public Health and Safety (Section 3.10), and Biological Resources (Section 3.5).
Frank Whitman (mail)	Sage Grouse ..... The U.S. Fish and Wildlife Service will decide Sept 15th of this year whether to list the bird as endangered. I don't see any thing in your document acknowledging this potential.	Since the publication of the Draft EIS, the United States Fish and Wildlife Service has determined that the Bi-State population of greater sage-grouse (*Centrocercus urophasianus*) does not require the protection of the ESA (80 FR 22827) and has removed the Bi-State greater sage-grouse from the list of candidate species. Further, an unprecedented, landscape-scale conservation effort across the western United States has significantly reduced threats to the greater sage-grouse across 90 percent of the species' breeding habitat and enabled the USFWS to conclude that the greater sage grouse does not warrant protection under ESA (Docket Number FWS–R6–ES–2015–0146). This collaborative, science-based greater sage-grouse strategy is the largest land conservation effort in U.S. history. While the Draft EIS did not mention an anticipated date of decision for the greater sage grouse, it presented its current status as a Candidate species as well as mentioned that the Bi-State Distinct Population Segment (DPS) is proposed to be listed as threatened under the ESA, with a special rule in addition to the proposed listing. Additionally, at the time of the DEIS publication, there had yet to be a determination for critical habitat for the sage grouse under ESA.

Commenter	Comment	Navy Response
Whitman - 2	My concern is about sonic booms and leking/mating season. Some of the areas designated for super sonic training are in areas identified as critical sage grouse habitat. The Marines over to Sweetwater suspend flight operations during leking season. There must be some reason, and I don't see any reference to noise impacts on sage grouse in the document.	The Draft EIS states that the response to sonic booms or other sudden disturbances is similar among many wildlife species—sudden and unfamiliar sounds usually act as an alarm and trigger a “fight or flight” startle reaction. The startling effect of a sonic boom can be stressful to an animal. This reaction to stress causes physiological changes in the neural and endocrine systems, including increased blood pressure and higher levels of available glucose and corticosteroids in the bloodstream. Continued disturbances and prolonged exposure to severe stress could deplete nutrients available to the animal. However, sonic booms are not expected to cause more than a temporary startle-response because the “pursuit” would not be present. Activities at the referenced marine training location are suspended during leking season as activities there consist of landing activities and equipment drops, which would represent a higher level of disturbance than aircraft overflights as marine training includes the physical presence of humans on the ground. Given the historical use of the airspace, and the persistence of aircraft operations and wildlife populations, wildlife within the Military Operations Areas are likely habituated to aircraft overflights and associated noise (e.g., sonic booms). Many of the above-listed behavioral and physiological responses to noise are within the range of normal adaptive responses to external stimuli, such as predation, that wild animals face on a regular basis. In many cases, individuals would return to homeostasis or a stable equilibrium almost immediately after exposure to a brief stimulus such as an aircraft overflight or sonic boom.
Whitman - 3	Sonic Booms ...... You should install noise sensitivity sensor in the Austin canyon. It would be easy to then clarify how big a boom is	Sonic booms are a normal, though uncommon, part of essential Naval Aviation training activities at the Fallon Range

Commenter	Comment	Navy Response
	boom when the citizens call in and complain. Or when they want to file damage reports for broken windows. The timing of the sonic booms is also an issue. please no booms before 0900. Sincerely Frank Whitman	Training Complex. The range normally opens for operations at 7:30am. Realistic training requires large numbers of complexly integrated forces training in all conditions, day and night, and such high volume of complex training activities dictates schedules. The Navy strives to minimize the impact of aircraft noise on the public while still accomplishing its mission. Populated locations are designated as Noise Sensitive Areas and are to be avoided by a minimum of 3000 feet in accordance with FAA regulations and Navy doctrine. Supersonic activities in the areas of concern are restricted to altitudes greater than 30,000 feet. Additional noise monitoring systems are deemed unnecessary as the Navy monitors activities within the range with radar and telemetry systems. Noise complaints are taken through the hotline number (775) 426-2419. Reports are compared to schedules and telemetry to determine whether flight rules were violated and then handled by the Navy accordingly.